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April 1990



Warner Wetlands Area of Critical Environmental Concern (ACEC) Management Plan



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U.S. Department of the Interior
Bureau of Land Management
Lakeview District Office
April 1990



Warner Wetlands Area of Critical Environmental Concern (ACEC) Management Plan

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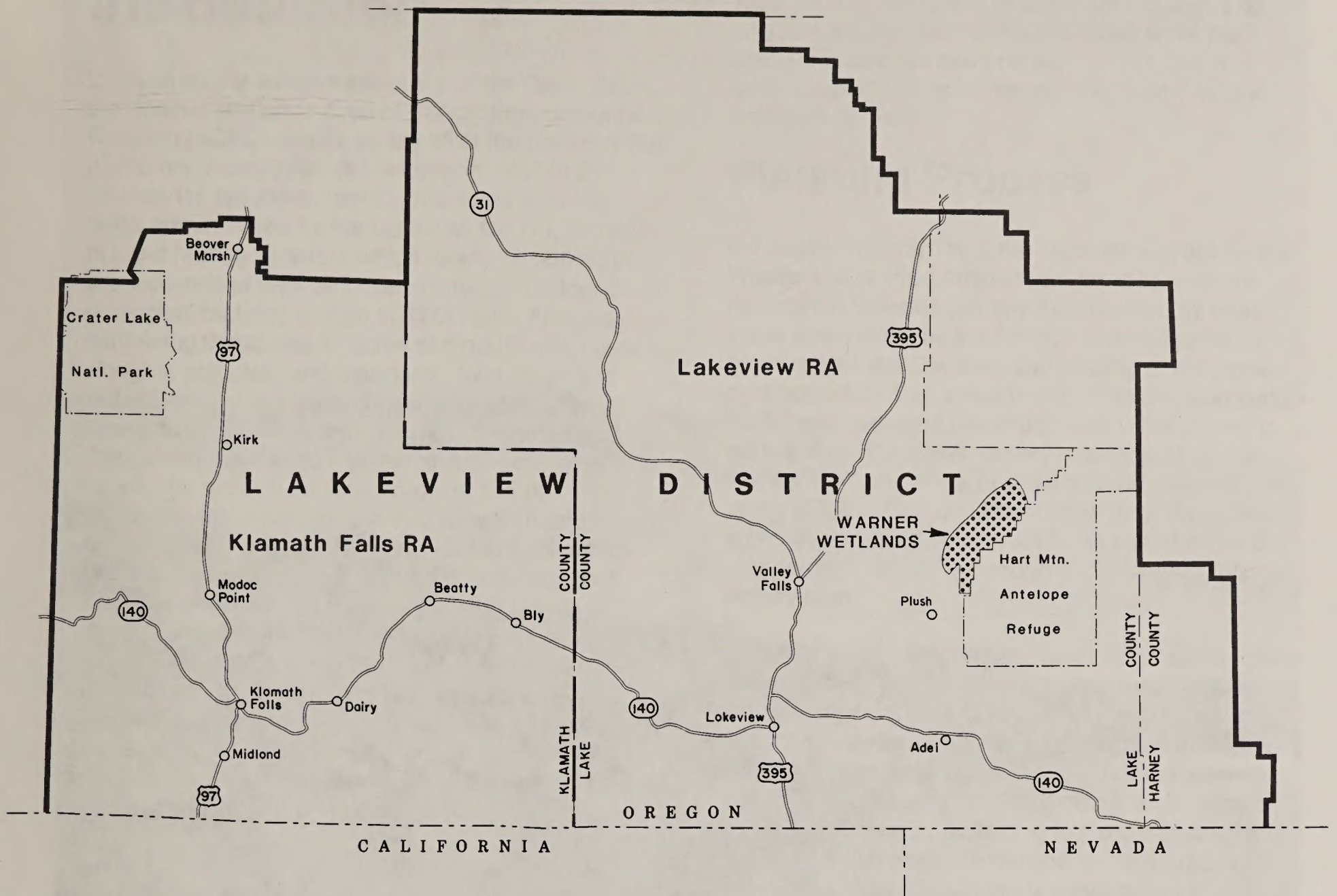
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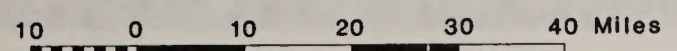
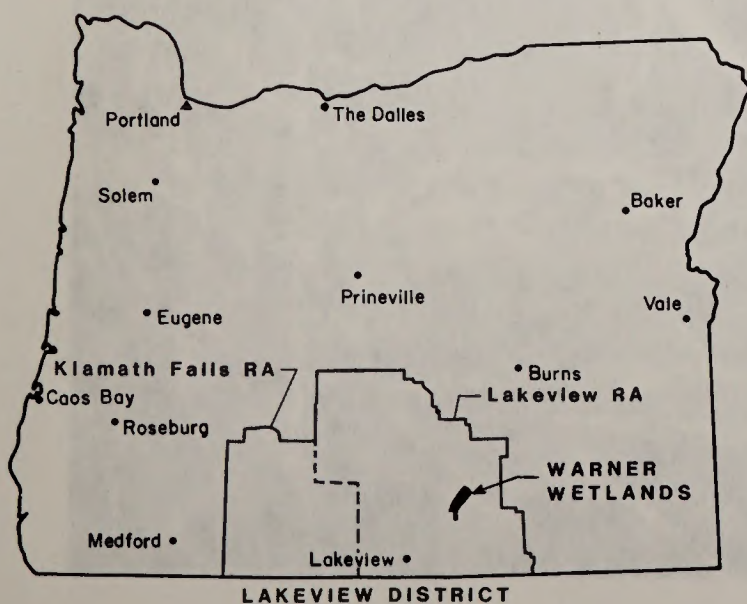


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1990

WARNER WETLANDS General Location Map

MAP 1





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Introduction

Located on the western periphery of the Great Basin, the Warner Wetlands Area of Critical Environmental Concern (ACEC) covers nearly all of the northern third of Warner Valley in southern Oregon. Within its boundaries are more than 51,000 acres of public lands administered by the Lakeview District, Bureau of Land Management; of which nearly 19,000 acres are wetlands of various kinds. Here can be found geological features unique in all of North America, containing thousands of acres of marshlands, lakes, sloughs, potholes, and meadows. Waterfowl and waterbirds by the tens and hundreds of thousands funnel through the valley each year on their migrations along the Pacific Flyway; and for additional thousands, the valley's wetlands provide summer nesting areas. Intricate and complexly interwoven and interactive vegetal communities provide the habitats for the diverse and abundant wildlife populations that have attracted Man to the valley for thousands of years. Here can be found a dynamic ecosystem containing traces of a hundred centuries of human use, hundreds of miles of lake and channel shorelines without houses or factories, undrained and unfilled swamps, marshes and meadows - a complex mosaic of uplands and wetlands where the forces of nature still outweigh those of humans.

Long a "secret spot" for some sportsmen, bird watchers, and nature enthusiasts, the Warner Wetlands burst into national prominence in 1987. Following a proposal by the Lakeview District to change the area's predominant land use from livestock grazing to a multiple-use mix of recognized and managed resource values, the Warner Wetlands were featured in national and regional magazines, newsletters, and information mailings. A formal nomination for ACEC status was received from The Nature Conservancy in January, 1987, and this nomination was incorporated into an amendment to the existing land use plan then in progress (Warner Lakes Plan Amendment for Wetlands and Associated Uplands).

Even before this amendment could be completed or a final decision issued, the concern and interest over the management of the Warner Wetlands had brought offers of funding support, volunteer labor, and other assistance from the Izaak Walton League, the Audubon Society, the National Wildlife Federation, Ducks Unlimited, and the Friends of Wildlife. Responding to the concerns of these and other groups, the U.S. Congress appropriated \$3,000,000 of Land and Water Conservation Fund monies in 1988 and

1989, for the acquisition of private in-holdings and adjacent wetland areas. Nearly 8,000 acres have been purchased to date, creating the 51,000 acre wetland/upland complex now known as the Warner Wetlands ACEC.

Planning Process

On September 29, 1989, the Decision Record for the Warner Lakes Plan Amendment for Wetlands and Associated Uplands (hereby incorporated by reference) was signed by the Oregon State Director, approving the Final Decision and Finding of No Significant Impact for that amendment. This decision superseded previous land use allocations in the planning area and designated a portion (see Map 2) as the Warner Wetlands Area of Critical Environmental Concern (ACEC). The implementation of the new management direction for the ACEC, as stated in the plan amendment, would be through a multiple-resource activity plan.

This ACEC plan is that multiple-resource activity plan, and is based upon the resource values and allocations made within the ACEC. Each section in this plan corresponds to an activity plan prepared for the various resources involved (wildlife habitat, geology, cultural resources, recreation, botany, and livestock grazing), completed according to the applicable BLM Manual requirements for the specific resources considered. As this ACEC plan is a summary of the six different activity plans, the level of detail normally found in a resource activity plan could not be carried forward without creating a cumbersome and lengthy document. Copies of each of the component activity plans and an environmental assessment are available from the Lakeview District Office, Bureau of Land Management, P.O. Box 151, Lakeview, OR 97630 (telephone 503-947-2995).

Planning Constraints

The Warner Lakes Plan Amendment for Wetlands and Associated Uplands established, in part, the parameters by which the Warner Wetlands ACEC is to be managed. Five separate geographic areas (see Map 3 and Tables I and II) within the ACEC were identified, each with its own management goal and objectives. All of these, however, must conform to the overall ACEC goal and objective. Listed below are those goals and objectives:

ACEC (all portions)

Goal: Emphasize the preservation and protection of unique wildlife, ecological, cultural and geological values identified within the ACEC.

Objective: Preserve ACEC values in the designated area.

Core Wetland Area (Acquired) and Core Wetland Area (Potholes)

Goal: Improve wildlife resource values, eliminating all conflicting uses, demands, and allocations.

Objectives

Protect, maintain, expand and improve wildlife habitats on the BLM-administered wetlands in these areas; manage these wetlands as wildlife habitat, to the exclusion of any conflicting or consumptive use.

Protect, maintain, expand and improve wildlife habitats on the BLM-administered uplands in these areas; manage these lands primarily for wildlife habitat, and secondarily for recreation and scientific activities not adversely affecting these wildlife habitats; other competitive or consumptive uses of these lands would be excluded.

Grazed Area (Potholes) and Grazed Area (Flagstaff Bench)

Goal: To provide for increased livestock forage production, while improving the composition, vigor, and density of the present range site plant communities.

Objectives

Determine the range site productivity, using the Ecological Site Method (ESI), on the public lands in these areas by 1996.

Establish an upward or improving trend in range site productivity on all public lands in these areas by 2008.

Make available for livestock grazing the current active preference until completion of the ESI, and then begin licensing any additional forage under provisions and procedures of 43 CFR 4100, as quickly as is consistent with the above objectives.

Meadow Management Area

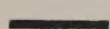
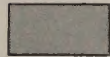


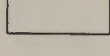
Goal: To place primary emphasis on improving wildlife habitat condition or enhancement while providing opportunities for other uses.

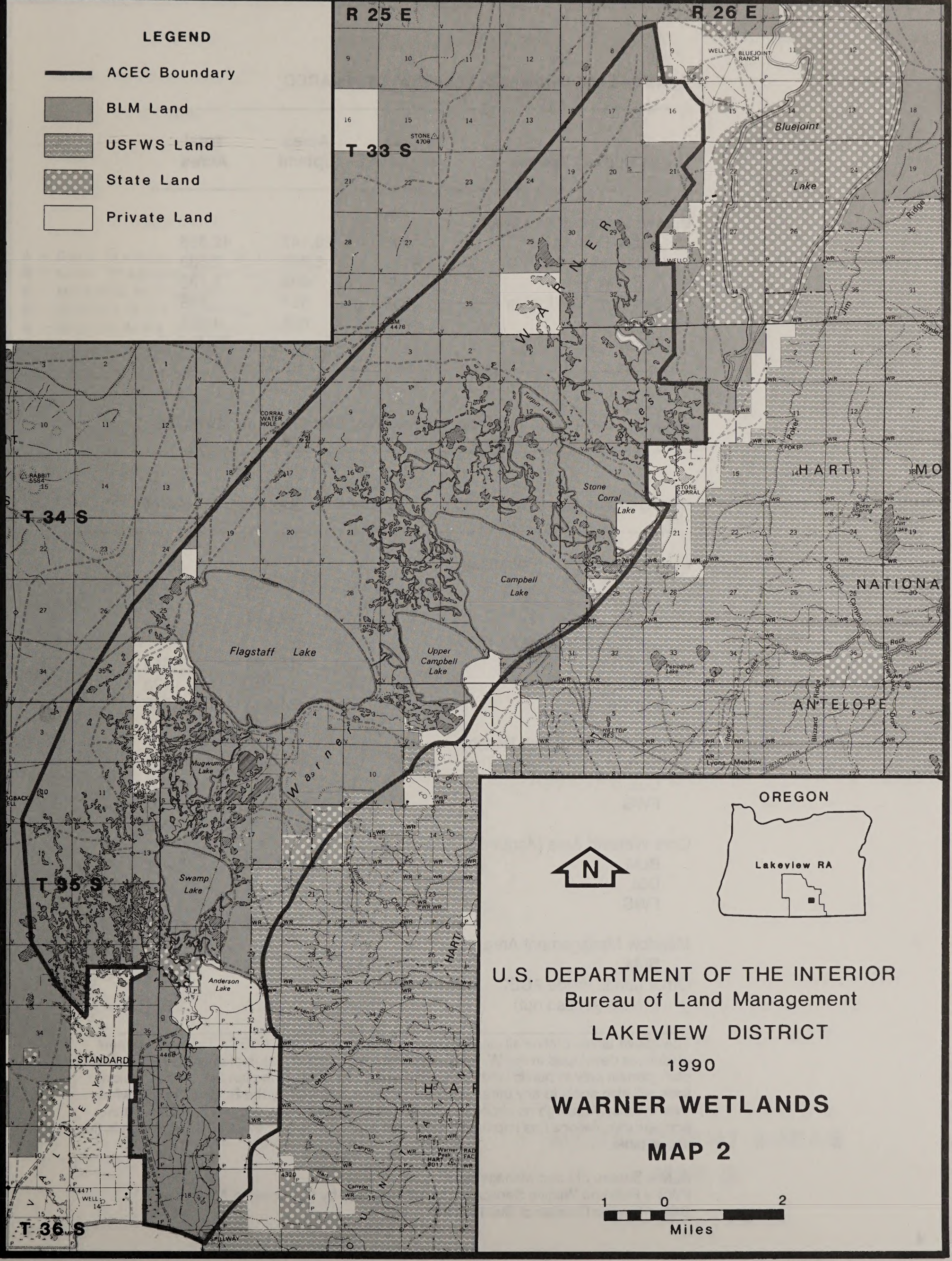
Objectives

There were no objectives in the plan amendment specific to this management area.

Each of the resource activity plans summarized in the following sections have management goals and objectives identified that are specific to that resource. These were all developed under the constraints imposed by the plan amendment goals and objectives listed above.

LEGEND

-  ACEC Boundary
-  BLM Land
-  USFWS Land
-  State Land
-  Private Land



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WARNER WETLANDS

MAP 2

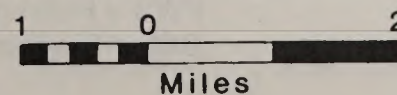


Table 1—Land Ownership, Warner Wetlands ACEC

Ownership or Control	Acres Wetland	Acres Upland	Total Acres
Bureau of Land Management			
Public Domain	14,248	28,147	42,395
Acquired	4,139	3,391	7,530
U.S.F.W.S.	182	938	1,120
Oregon Div. State Lands	291	557	848
Private	N/A	N/A	4,602
Total			56,495


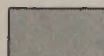

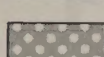
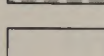
Table 2—Ownership by Management Area, Warner Wetlands ACEC

Management Area/Ownership	Acres Wetland	Acres Upland	Total Acres
Core Wetland Area (Potholes)			
BLM	10,700	10,558	21,258
FWS	182	153	335
	10,882	10,711	21,593
Grazed Area (Potholes)			
BLM	1,687	15,863	17,550
DSL	21	102	123
Private	132	1,533	1,665
	1,840	17,498	19,338
Grazed Area (Flagstaff Bench)			
BLM	25	2,260	2,285
DSL	0	330	330
FWS	0	665	665
	25	3,255	3,280
Core Wetland Area (Acquired)			
BLM	5,565	2,847	8,412
DSL	275	120	395
FWS	0	120	120
	5,840	3,087	8,807
Meadow Management Area			
BLM	410	10	420
Other Lands Inside ACEC			
Private (fenced out)	N/A	N/A	2,937

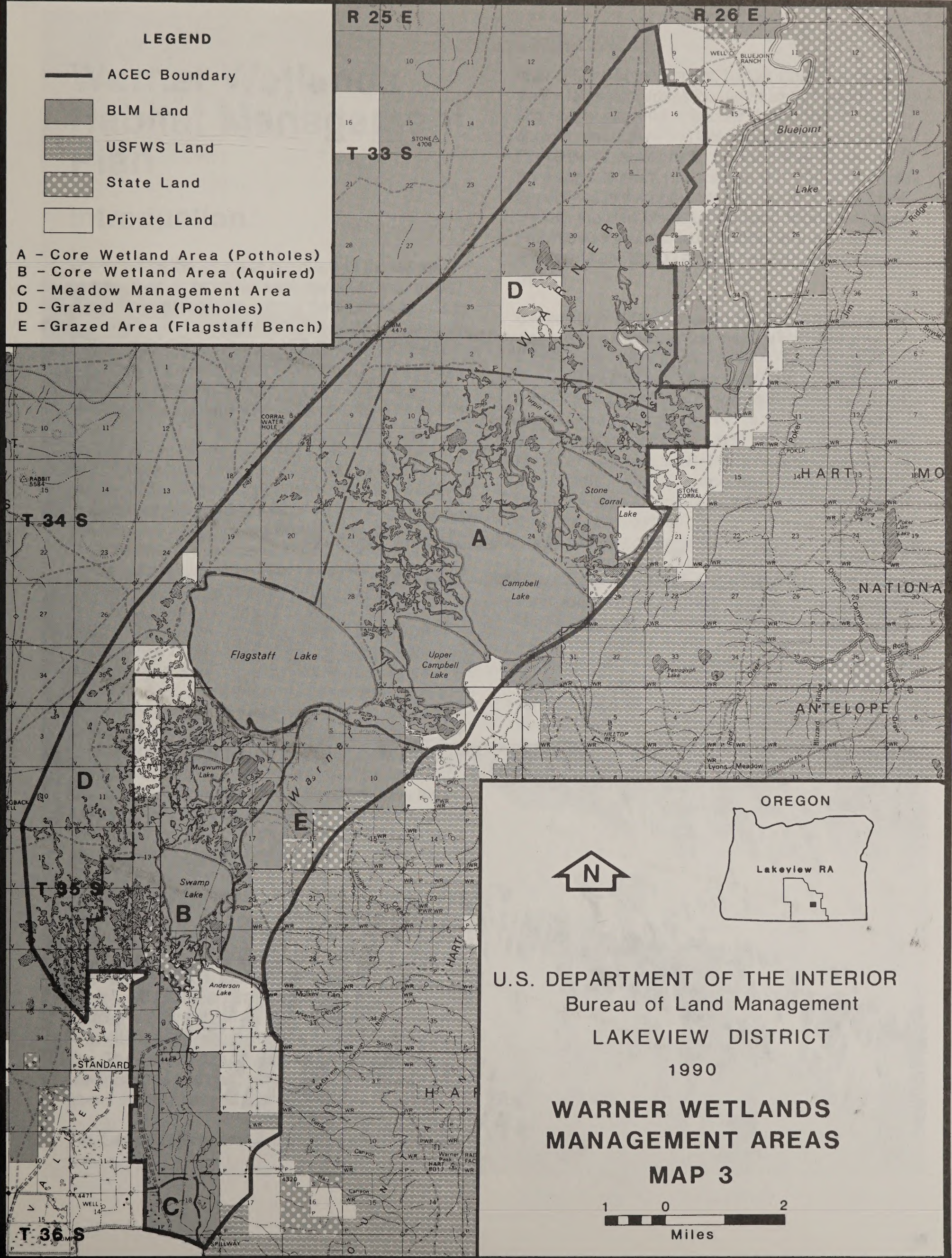
The above tables outline all lands within the Warner Wetlands ACEC. The management guidelines developed in the Warner Lakes Plan Amendment, as implemented by this ACEC plan, pertain only to public lands administered by the BLM. The plan amendment guidelines will also apply to any other lands that may be acquired by the Bureau through whatever means. Although no change in the ACEC boundaries has occurred, refinement in acreage calculations has improved the accuracy of acreages in the ACEC, as shown in the above table.

BLM = Bureau of Land Management
FWS = Fish and Wildlife Service (BLM Administered by Cooperative Agreement)
DSL = Oregon Division of State Lands

LEGEND

-  ACEC Boundary
-  BLM Land
-  USFWS Land
-  State Land
-  Private Land

- A - Core Wetland Area (Potholes)
- B - Core Wetland Area (Aquired)
- C - Meadow Management Area
- D - Grazed Area (Potholes)
- E - Grazed Area (Flagstaff Bench)



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1990
WARNER WETLANDS
MANAGEMENT AREAS
MAP 3

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Warner Wetlands Habitat Management Plan

Introduction

Waterfowl by the tens and hundreds of thousands funnel into Warner Valley each spring as they move along the aerial corridors of the Pacific Flyway. Compact waves and straggling lines of ducks, geese and swans drop into the Valley's wetlands for food and rest. In smaller flights and often by night, come the herons, egrets, grebes and other birds of the marshlands. Some have travelled a few hundred and others a few thousand miles to reach this mid-way resting area; and most have nearly a thousand miles yet to fly. Many will remain for a few weeks, others for a couple months, regaining the body weight lost to the tremendous energy demands of long distance migration. Several thousand will remain each spring to nest in the fields and marshes of the Warner Valley, where they can find the mixture of cover, water, feeding and brooding habitats necessary for raising their young.

Each of the species remaining to nest in the Valley has a slightly different set of habitat requirements; dense cover for the cinnamon and blue-wing teal, open meadows for northern shovelers and long-billed curlews, thick tules and cattails over water for canvasbacks, grebes and bitterns. And for each, the proper habitats and mix of habitats can be found somewhere in the wetlands of Warner Valley. Current and past land uses practices have not always left these habitats in the best possible condition for nesting and brood rearing, but the biotic potential is there to be one of the best production areas in the Pacific Flyway.

With the coming of winter, the migration of the marsh birds begins once more, headed south this time. Again vast flocks of birds circle and drop into the valley to rest and feed, rebuilding the fat and muscle reserves necessary to survive the winter. Pondweeds, grain, seeds, grasses and aquatic invertebrates are consumed by the ton as the birds regain strength from the rigors of Arctic nesting and migration. They will remain for as long as open water and feeding areas can be found, moving south once again ahead of the snow and ice of December.

The Lakeview Resource Area, Lakeview District, Bu-

reau of Land Management, has jurisdictional responsibility for almost sixty thousand acres of vacant and acquired public land in Warner Valley, fifty thousand of which are included in this Habitat Management Plan (HMP). Additionally, the Lakeview Resource Area administers 1,120 acres of U.S. Fish and Wildlife Service lands through a memorandum of understanding with the Hart Mountain National Antelope Refuge. Within these two classes of public land is a total of approximately 18,500 acres of wetlands of various types.

Beginning in 1986, the Lakeview Resource Area initiated an amendment to the existing land-use plan (Warner Lakes Management Framework Plan) in order to place increased emphasis on the management, protection and enhancement of these wetlands. This planning change resulted in the Warner Lakes Plan Amendment for Wetlands and Associated Uplands, which was issued with a Proposed Decision in May, 1989. A Final Decision was issued in September, 1989, and it is this decision that forms the basic guidance for this HMP.

Concurrent with this change in management direction for the existing public wetlands in Warner Valley, the U.S. Congress appropriated three million dollars of Land and Water Conservation Fund (LWCF) monies for the acquisition of private wetlands. To date, two purchases totaling nearly 7,500 acres have been made. Additional acquisitions and/or exchanges are also being investigated or negotiated. Using the guidelines established in the plan amendment, the Warner Wetlands Habitat Management Plan outlines the specific on-the-ground habitat improvement techniques that will be used on the public wetlands, both present and future, of the HMP area.

Planning Guidelines and Management Objectives

Listed below are the planning guidelines and wildlife habitat management objectives for the five separate units of the HMP area. These were developed in the Warner Lakes Plan Amendment for Wetlands and Associated Uplands and in the Warner Wetlands Habitat Management Plan; both of which are hereby incorporated by reference.

Core Wetland Area (Potholes)

This area contains approximately 59% (10,882 acres) of the public wetland habitats found in the HMP area. Further acquisitions through purchase or exchange are being investigated. The plan amendment goal for this area is to "Improve wildlife resource values, eliminating all conflicting uses;" the HMP goal for this area is "To re-establish a naturally functioning wetland ecosystem, containing both wetland and associated upland components, on the 21,593 acres of public land in this management unit." The HMP objectives are:

Objective #1: Within six years of implementation, improve the waterfowl nesting habitat condition from 5% good to 67% good condition and from 80% to less than 5% poor condition.

Objective #2: Within ten years of implementation, improve the waterfowl nesting density from 1.5 to at least 4.1 nests per mile of shoreline on 80% of the management area.

Grazed Area (Potholes)

This area contains approximately 10% (1,840 acres) of the public wetland habitats in the HMP area. No acquisition involving wetlands is currently in progress, but several possibilities involving private and state lands are being explored. The plan amendment goal for this area is "To provide for increased livestock forage production, while improving the composition, vigor, and density of the present range site plant communities." No wildlife habitat management objectives were developed for this area.

Grazed Area (Flagstaff Bench)

This area contains only 25 acres (0.1%) of public wetland habitat in the HMP area. This total will not be increased by the addition of private wetlands that may be acquired. The plan amendment goal for this area is "To provide for increased livestock forage production, while improving the composition, vigor, and density of

the present range site plant communities." No wildlife habitat management plan objectives were developed for this area.

Core Wetland Area (Acquired) and Meadow Management Area

This area contains 5,975 acres (31%) of wetland habitats in the HMP area. The plan amendment goal for this area is to "Improve wildlife resource values, eliminating all conflicting uses;" the HMP goal for this area is "To improve and enhance the overall biotic diversity of the wetland and associated upland ecosystem on the 8,952 acres of public land in these management areas by providing habitats for the greatest diversity of water related species at the highest nesting densities consistent with maintaining that diversity." The HMP objectives are:

Objective #1: Maintain, enhance, and develop sufficient nesting, feeding, and brood habitats to support a minimum breeding population of 2,000 pairs of deep-water emergent marsh nesting species (canvasback, redhead, ruddy duck, pied-billed and Clark's grebe, black tern, least bittern, and Virginia rail) within 5 years of implementation.

Objective #2: Maintain, enhance, and develop sufficient nesting, feeding, and brood habitats to support a minimum breeding population of 2,000 pairs of shallow emergent marsh/marsh edge nesting species (blue-winged and cinnamon teal, lesser scaup, Wilson's phalarope, eared grebe, white-faced ibis, American bittern, coot, and sora rail) within 5 years of implementation.

Objective #3: Maintain, enhance, and develop sufficient nesting, feeding, and brood habitats to support a minimum breeding population of 3,000 pairs of intermingled marsh, meadow, and upland habitat nesting species (mallard, northern pintail, Great Basin Canada goose, northern shoveler, green-winged teal, gadwall, greater sandhill crane, willet, and common snipe) within 5 years of implementation.

Objective #4: Maintain and enhance sufficient meadow nesting habitat to support a breeding population of at least 8 pairs of long-billed curlews within 1 year of implementation, and 15 pairs within 5 years.

Objective #5: Develop sufficient vertical habitat structure and nesting substrate to support a breeding population of at least 100 pairs of tree-nesting, colonial waterbirds (great blue heron, great egret, snowy egret, and black-crowned night heron) within 20 years of implementation.

Management Areas, Key Habitat Areas, and Management Regimens

Management Areas

Core Wetland Area (Potholes)

Excepting the removal of livestock grazing, no habitat enhancement or improvement projects are proposed for this area. The natural configuration of the channel and pothole system provides as fine a mix of habitat components (nesting cover, brooding areas, feeding habitats, etc.) in close proximity to each other as is likely possible. With the increase in residual nesting cover and overall vegetal height, the natural function of this wetland ecosystem will produce better habitat than could be designed or built. In terms of waterfowl production, this increased residual cover will allow a significant increase in nesting densities and success rates to occur. Current habitat inventories indicate that 80% of the shorelines in this area are not used for nesting because of an almost complete lack of residual cover. Another 15% of the shorelines are sparsely used (1.5 nests/mile), again because of limited nesting cover. The remaining 5% of the shoreline, where cover heights exceeded 12 inches, had a nesting density of 4.1 nests/mile.

Within six years of fencing the Core Wetlands, nesting habitat condition should improve from 5% good to 67% good condition. Nesting densities along the 80% of the shorelines not currently used are expected to increase to between 2 and 3 nests per mile. Within ten years of implementation, fully 80% of the management area should have nesting densities in excess of 4 per mile. These nesting density estimates are based on one year's limited inventories, and there is no reason to expect that densities of 8 to 12 per mile would not be attainable on portions of the management area during favorable water years.

The survival rate of the young ducks produced in each nest is also expected to increase because of the higher quality escape, brood, and feeding habitats that will be available. Emergent vegetation in the shallow waters near shore will become the primary brood feeding and escape habitat, a habitat that is currently lacking. Denser shoreline and upland cover will also increase brood survival rates by providing better concealment and escape cover.

An overall increase in the diversity and productivity of all wildlife habitats present will occur. This will lead to a more diverse and numerous nesting population for upland as well as water related species. In allowing

the natural ecological processes to function again without major human disturbance, this area will begin approximating an operational natural wetland/ upland ecosystem complex within ten years of implementation.

Grazed Areas (Potholes and Flagstaff Bench)

No habitat enhancement or protection projects are planned within this area. The small amount of wetland habitat in these areas, coupled with the basic management guidelines under which the areas are to be managed, does not warrant substantive investments in habitat management for these areas.

Core Wetland Area (Acquired) and Meadow Management Area

These two areas comprise the bulk of the land acquired with the LWCF monies appropriated in 1988 and 1989, as well as some scattered parcels of vacant public land and Fish and Wildlife Service lands. Even though these two areas have slightly different management goals, they are being considered together in this HMP because the type and extent of the project work planned is similar. The Core Wetland and Meadow Management Areas are an interconnected and interdependent mosaic of natural and man-made wetlands, containing meadows, deep and shallow water emergent communities, channels, sloughs, ponds, and lakes. The diversity and productivity of the habitats present has made these wetlands an important nesting area for waterfowl and waterbirds, even under the intensive agricultural practices of the past. In changing the primary use from farming to wildlife habitat, these acquired lands should become one of the more important production areas in this portion of the Pacific Flyway.

The acquisition of these lands also brought with them slightly more than 13,000 acre-feet of appropriated water rights in the Warner Basin. The distribution, timing, depth control, and impoundment of these irrigation waters provides the primary habitat management tool available. There are more than forty-five miles of natural and man-made ditches and channels that have been used in irrigating these lands. After several years of flooding and neglect, the irrigation system is only partially functional. Some ditches are filled with silt, water control structures have washed out, and the main irrigation pump inlet from Hart Lake is choked with sand and gravel. The highest priority project work will be to rehabilitate the system so that the right amount of water can be put in the best place at the proper time to achieve the greatest diversity of habitats.

Key Habitat Areas and Management Regimens

Target species and management regimens have been developed for various portions of the management areas, and the success in providing improved habitats for the target species will be used as an indicator of successful habitat improvement for other species with similar requirements. For example, by improving and/or expanding the deep-water emergent habitats used for nesting by canvasback and redhead ducks, the habitats for grebes, terns, bitterns and rails will also be improved or expanded.

Additionally, the management regimens are aimed at the differing uses of the same habitats by different species throughout the year. Water and vegetation manipulation will allow meadow habitats that are critical for successful long-billed curlew nesting to become important feeding areas for migrating waterfowl, winter hunting grounds for rough-legged hawks and bald eagles, and summer grazing areas for Great Basin Canada geese. Heavy cover growth along adjacent channels will also increase the foraging use of the meadows by quail, pheasants and mule deer. Similar year-long management strategies have been developed for the other habitat and community types present.

Deep-water Emergent Marsh Communities

With minor exceptions, these are tule, cattail, and burreed communities maintained only by the application of irrigation water during the growing season, or by flood waters during periods of above average runoff.

Target Species: Canvasback and redhead ducks; other benefitting nesting species - ruddy duck, pied-billed grebe, western grebe, Clark's grebe, black tern, least bittern, Virginia rail, marsh wren, yellow-headed and red-winged blackbirds.

Management Regimen: Retain at least 24" of water in the dense bulrush, cattail, and burreed stands through mid-July; provide an interspersed of dense emergent cover and open water habitats; establish and maintain 30-40% in open water, with opening sizes varying from 0.1 - 5 acres in size; use periodic drying, winter burning, pothole blasting, and dredging to prevent stagnation of the communities, allow nutrient recycling, and maintenance of maximum edge between community components.

Habitat Usage: Primary production habitats for species listed above; small inclusions of marsh-edge and upland habitats will also provide nesting habitats for dabbling ducks, sandhill cranes, and Canada geese; feeding, brood, and molting habitats for dabbling ducks; as drying proceeds after irrigation season, feeding habitats for white-faced ibis, sandhill cranes, herons, egrets and snipes.

Shallow Emergent Marsh/Marsh Edge

These are also communities maintained primarily by irrigation waters, or periodically flood waters, and form a complex, inter-twined mosaic with almost all other communities present.

Target Species: Lesser scaup, cinnamon teal, white-faced ibis; other benefitting nesting species - blue-winged teal, Wilson's phalarope, eared grebe, American bittern, black-necked stilt, coot, sora rail, marsh wren, and blackbirds.

Management Regimen: Cover heights maintained at 12+" interspersed with both taller and shorter cover heights; maximum interspersed of dry to moist ground surface sites with shallow emergent marsh sites (i.e. standing water less than 12" deep); interspersed with deep-water communities to provide brood and feeding areas; use periodic drying, burning, mowing, or grazing to maintain community vigor and to prevent stagnation and lodging; use pothole blasting, level ditching, and heavy equipment as needed to maintain surface contour and interspersed of water depths and habitat edge.

Habitat Usage: Primary production habitat for species listed above for this habitat; feeding and brood habitat for dabbling ducks; feeding habitat for cranes, herons, egrets, and rails; migratory feeding habitat for waterfowl in spring.

Intermingled Marsh, Meadow, and Upland Communities

This is even more an aggregate of habitat types than the preceding descriptions; the prime determinant being the presence of significant (20-40%) upland inclusions. The species considered as the target group can be found nesting in any of the other habitat areas, but will reach their highest densities here. This is primarily a function of the amount of internal habitat diversity and edge.

Target Species: Northern pintail, cinnamon teal, mallard, gadwall, green-winged teal, and sandhill crane; other benefitting nesting species - Canada goose, northern shoveler, willet, common snipe, spotted sandpiper, and northern harrier.

Management Regimen: Cover heights maintained at 12+” interspersed with both taller and shorter cover heights; at least four heavily vegetated shallow marshes or ponds within 1/4 mile of nesting area and at least one larger (5+ acres) pond or lake within 1/3 mile of brooding areas; periodic drying and winter burning to maintain edge and productivity; pothole blasting, level ditching, bottom contouring as needed to enhance water/cover diversity.

Habitat Uses: Primary production habitat for species listed above for this habitat; feeding and brood habitat for all species except diving ducks; spring migratory feeding and resting areas, also in fall if water present.

Meadow Communities

There are several different types of meadows present in the management area: unirrigated creeping wildrye and saltgrass meadows; subirrigated Kentucky bluegrass meadows; irrigated bluegrass, sedge, and canarygrass meadows; and intermixed combinations of all of the above.

Target Species: Long-billed curlew, sandhill crane; other benefitting nesting species - northern shoveler, northern pintail, willet, short-eared owl, northern harrier.

Management Regimen: Cover heights maintained between 4 and 8 inches on at least half of the drier meadows for curlew nesting, with both taller and shorter cover heights interspersed; mowing, burning, tightly controlled grazing and/or water control used to attain the desired vegetal heights; rotational (both temporal and geographic) use of irrigation water to maintain meadow productivity and to provide temporarily flooded portions as feeding areas; careful monitoring of irrigation waters after onset of nesting (early May) to prevent nest flooding.

Permanent and Semi-permanent Lakes and Ponds

Those water bodies being considered here are those with a usual size in excess of 20 acres; understanding that all will be dry during droughts and connected into one vast lake during floods.

Target Species: All waterfowl and water birds nesting in the HMP area, as well as all spring/fall migrants.

Management Regimen: To the extent possible, maintain a stable pool size except as necessary for habitat manipulation; a target of 75%/25% dense shoreline cover/bare shoreline mix to provide loafing and preening areas for nesting waterfowl from this and adjacent areas; open water with aquatic vegetal communities interspersed with emergent stands of bulrush, burreed, and spikerush; periodic drying for pondweed germination; and winter burning for edge and cover height interspersion.

Habitat Usage: Production and feeding habitat for species considered in all above habitat areas; migratory feeding, loafing, and staging areas; post-nuptial molting habitat; secure resting and feeding habitats for newly fledged birds.

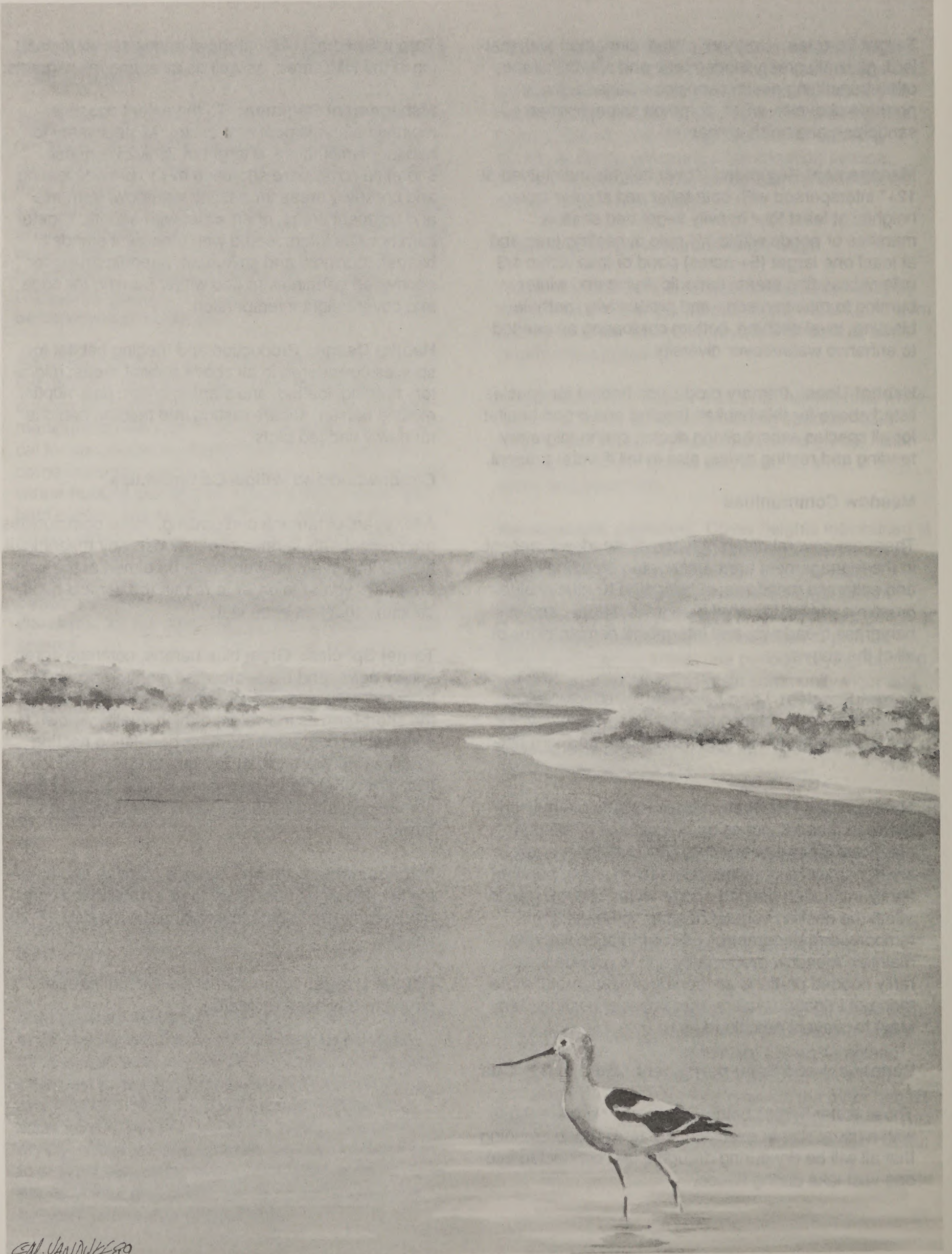
Cottonwood and Willow Communities

After years of farming and grazing, these communities are present only in relict populations. Any meaningful habitat improvement work must be aimed at the long-term (20+ years) in order to regain the vertical habitat structure that has been lost.

Target Species: Great blue herons, common egret, snowy egret, and black-crowned night herons in the long-term; willow flycatchers and yellow warblers in the short-term as indicators of high quality willow/cottonwood communities; other benefitting nesting species - northern oriole, western kingbird, various flycatchers, warblers, sparrows, Cooper's hawk, great horned owl, sharp-shinned hawk, and Swainson's hawk.

Management Regimen: Beyond planting and nurturing the seedlings necessary to re-establish the communities, little can be accomplished in the next 15-20 years.

Habitat Usage: Minimal until the vertical habitat structure has been recreated.



EM. VAN DYKE '89

Management Techniques and Project Cost Estimates

There are several management techniques that will be used throughout the areas as needed. As already discussed, water control and burning may be used to manipulate vegetation and increase habitat diversity. Mowing and tightly controlled grazing may also be used in the Meadow Management Area to accomplish this, and some portions of the remainder may also be mowed. In reconstructing and maintaining the water distribution system draglines, scrapers, crawler tractors and backhoes will be used. Explosives may be used to construct temporary ditches, enhance open-water/emergent vegetation interspersions, and to create small brooding and feeding ponds.

Plantings and revegetation work will be completed to achieve specific habitat management goals. This will include: willow and cottonwood plantings along all major dikes; food patch and cover plantings; revegetation with native species in areas disturbed during maintenance of the irrigation system; and small grain or annual grass plantings in dry ponds and fields for migrant feeding areas. Additional projects of this type may be developed as a better understanding of the complex interplay of habitat components and specific habitat requirements is gained. All work will be designed to be as visually and aesthetically unobtrusive as possible. Existing ditches and channels will be used for water control and these will be allowed to vegetate as heavily as is consistent with moving the water (i.e. no "clean", concrete, or channalized ditches). The overall aspect or management philosophy of the area is to have as natural an appearance as is consistent with the intensive habitat management planned. In portions of the HMP area where no intensive management is planned, i.e. Core Wetland Area (Potholes) and the northern third of the Core Wetland Area (Acquired), the natural functionings of the ecosystem will be allowed to determine the direction and magnitude of habitat changes.

There are three additional management aspects, for which nothing is currently proposed, but which will be subject to corrective action in the future should a habitat or management impacting problem arise. These are the management of the muskrat and beaver populations, predator populations, and recreational visitor use. Any of these have the potential to severely impact the habitat condition, nesting populations and the attainment of the HMP's goals and objectives. Should this happen, action consistent with the management provisions established in the Warner Lakes Plan Amendment for Wetlands and Associated Uplands would be taken.

Projects and Cost Estimates

Wildlife habitat enhancement projects are currently planned for only two of the five management areas, the Core Wetland Area (Acquired) and Meadow Management Area (Acquired). Removal of livestock grazing from the Core Wetland Area (Potholes) is all that is considered necessary there now. Monitoring studies will be established to measure the changes in habitat condition resulting from this removal, and project work could be included in future revisions of this plan if necessary. The two remaining areas contain little wetland habitat; and with the primary emphasis on livestock forage production in these areas, the investment of habitat improvement funds cannot be justified.

The following list contains the projects and estimated costs currently planned for the first ten years.

Initial Set-up Projects

Fences

South Boundary, 7.5 miles	\$ 27,500
Meadow Management fence 2 miles	\$ 6,000
West Boundary, 1.5 mi. new fence, 7 mi. maintenance	\$ 10,000
Fence Removal, 10 miles	<u>\$ 3,500</u>
	\$ 47,000

Irrigation System – Hart Lake

Dike Repair	\$ 48,000
Dike Construction	\$ 95,000
Detention Dam Repair	\$ 18,000
Irrigation Pump and Station	<u>\$ 50,000</u>
	\$211,000

Irrigation System – Honey Creek

Dike and Ditch Repair	\$ 29,000
Control Structure Replacement	\$ 23,000
Lateral Distribution Ditches	<u>\$ 35,000</u>
	\$ 87,000

Road and Levee System

West (or Main) Levee, 4 miles of gravel cap, turn-arounds and levee repair	\$ 34,000
North Levee, 1.5 miles gravel cap, 3 miles new construction	\$ 54,000
Flood Control Levee, 5.5 miles maintenance	<u>\$ 27,000</u>
	\$115,000

Brood and Nesting Habitat Projects

Pothole blasting, 200 holes @ 250 cu.yd. ea.	\$ 54,000
Level ditching, 20,000 cu. yd. along 5 miles of ditch	\$ 30,000
Push-up islands, barrier moats, silt removal, etc.; 35,000 cu.yd.	\$ 40,000
Willow and cottonwood plantings	<u>\$ 20,000</u>
	\$144,000

Irrigation Wells

Drilling, casing, etc.	\$ 18,000
Equipping	\$ 10,000
Power hook-ups	<u>\$ 12,000</u>
	\$ 40,000

Equipment Purchases

All-wheel drive farm tractor with implements & transport trailer	\$ 50,000
2 ATV's with transport trailer	<u>\$ 12,000</u>
	\$ 62,000

Storage/Work Facility	\$ 75,000
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Signs, Including Portal, Directional, Boundary and Interpretive	\$ 22,000
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Project survey and design; contract preparation and administration; NEPA, Endangered Species Act, Antiquities Act, etc. compliance. 25 work-months @ \$3,000 each	\$ 75,000
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Set-Up Cost Summary

Fences	\$ 47,000
Irrigation—Hart Lake	\$211,000
Irrigation—Honey Creek	\$ 87,000
Road/Levee System	\$115,000
Brood & Nest Habitat	\$144,000
Irrigation Wells	\$ 40,000
Equipment	\$ 62,000
Storage/Work Facility	\$ 75,000
Signs	\$ 22,000
S/D, NEPA, etc.	<u>\$ 75,000</u>
	\$878,000

Annual Costs

Work-months and positions

Maintenance of irrigation system, irrigating, seeding, planting, etc.— one FTP Wildlife Technician	\$ 24,000
Project coordinator/manager, develop and run monitoring program, research proposals, prescribed burning, project design, etc.; one FTP Wildlife Biologist	\$ 30,000
Seasonal bio./bio.tech. for studies, monitoring, inventories, etc.	<u>\$ 24,000</u>
	\$ 78,000

Maintenance Materials – Facilities

Estimate of annual needs for maintenance of irrigation system, fences, structures, signs, etc.	\$ 5,000
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Maintenance Materials – Habitats

Estimates of material needs for seedings, prescribed burns, weed control, etc.	\$ 20,000
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Fixed Costs

Water users association fees and assessments, electric power bills, monthly use fees on assigned vehicles and equipment, etc.	\$ 37,000
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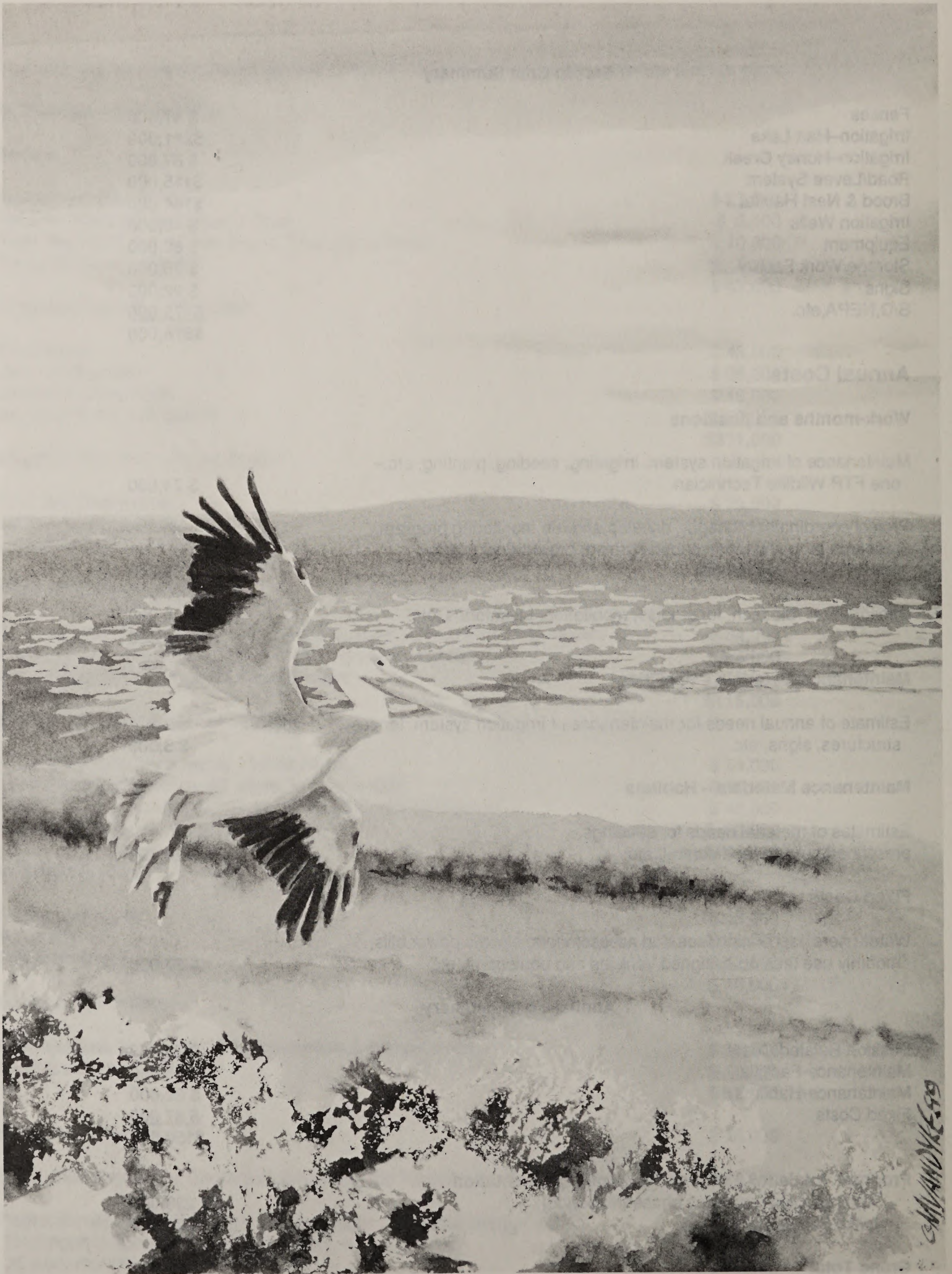
Annual Cost Summary

Position Related Costs	\$ 78,000
Maintenance-Facilities	\$ 15,000
Maintenance-Habitats	\$ 20,000
Fixed Costs	<u>\$ 37,000</u>
	\$150,000

Program Totals for First Ten Years of Implementation

Annual Costs (assumes phase-in 2period)	\$1,238,000
Initial Set-Up Costs	\$ 878,000

Grand Total	\$2,116,000
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Warner Wetlands Allotment Management Plan

Introduction

General Location

The Warner Lakes Allotment #0523 is located in the northern end of the Warner Basin. The geographical center of the allotment is approximately 15 air miles northeast of Plush, Oregon. On the east, the allotment is bordered by the Hart Mountain National Antelope Refuge and to the west by the Rabbit and Coyote Hills.

Historical Use

This allotment has historically been used from early-April to mid-October annually. An individual use area, the Well pasture, is used by Martin (Roy) Anderson and receives alternate years rest. The remainder of the allotment is a common use area used by the four permittees (McKee, Laird, Anderson, and Kiely) in the allotment. In recent years, McKee has used only the area known as Flagstaff Bench while trailing to and from the Hart Mountain National Antelope Refuge, where he has a summer permit to graze livestock. A summary of the permittees and their preference is displayed in the following tabulation.

Topography, Vegetation and Soils

The topography of the allotment is relatively flat, with the only relief being the dunes, sloughs and channels which are extensive throughout the allotment. Water levels in the sloughs fluctuate annually but tend to run in about ten year cycles of flooding and drying.

The vegetal communities that occur in the Warner Lakes allotment were investigated under a National Science Foundation Grant to Oregon State University in 1978, and a more detailed investigation specific to the public lands in this allotment was conducted by Bureau personnel in 1987. Fifteen major plant communities or associations were identified, six on uplands and nine on wetland areas.

Detailed information on the composition, location, and associated soils for these communities can be found in the Warner Lakes Plan Amendment for Wetlands and Associated Uplands. The plant communities found on upland sites are often highly mixed with each other and with the wetland communities. Many of the community boundaries are presently in a state of flux in response to record high water levels in 1983-84.

Soils in the allotment vary only slightly. The dominant soils are of the Loftus, Scherrard and Crump-Pitt series, with each supporting a slightly different plant communities.

Permittee Name	Total Preference AUM's	Active Preference AUM's	Suspended AUM's
Kiely Bros.	877	661	216
W.C. Laird	415	326	89
McKee Ranch	390	304	86
M. Anderson	365	365	0
Totals	2,047	1,656	391

Ecological Status and Trend

Ecological status was determined in 1987 for a portion of the public lands within the allotment. The Ecological Site Inventory (ESI) method was used in making this determination. Ecological status was not determined on sloughs, channels, ponds or lakes due to the fluctuating water levels and the way it affects the plant communities associated with them.

Ecological Status

Public Acres	Pot. Nat. Community	Late Seral	Mid-Seral	Early Seral	Unknown No Data
39,653 (100%)	0 (0%)	63 (1%)	22,638 (57%)	7,747 (19%)	9,205 (23%)

During the ESI, apparent trend was observed to be static. While doing this apparent trend evaluation, other observations were made and are as follows:

- Desirable grasses have moderate vigor.
- Some seedling establishment of desirable grasses were present.
- Only a few seedlings of invader and undesirable plants present
- Surface litter is accumulating in place.
- There is very little evidence of pedestalling or erosion.

Planning Guidelines and Management Objectives

The Warner Lakes Plan Amendment for Wetlands and Associated Uplands final decision was issued in September, 1989. This plan amendment is bringing major changes to the management of the Warner Lakes Allotment. Basically, the allotment was divided into two management areas, one to be grazed and the other not. The allotment, as a whole, is now in an Area of Critical Environmental Concern (ACEC). Fundamental management directions for the public lands within the Activity Plan / ACEC area are summarized as follows:

Core Wetland Area (Potholes)

Livestock grazing is precluded from the 20,898 acres of public land in this area by the management goal selected, i.e. "Improve wildlife resource values, eliminating all conflicting uses".

Grazed Area (Potholes)

This area contains 17,550 acres of public land that remains open to livestock grazing. More acreage may become available in this area from pending State land exchanges and the possible acquisition of private lands. The management of this area is: "To provide for increased livestock forage production, while improving the composition, vigor, and density of the present range site plant communities".

Grazed Area (Flagstaff Bench)

This area contains 2,425 acres of public land that remains open to livestock grazing. Additional acreage may become available from pending land exchanges and acquisition. While this area is physically separated from the above grazed area by the core wetland area, the management goal is the same.

Allotment Management Plan Objectives

- Implement a grazing system that will establish an upward or improving trend in range site productivity, as determined by the ESI method, on the entire grazed portion of the allotment.
- Make available, for livestock grazing, 922 AUMs in the grazed portion of the allotment annually until rangeland improvements are developed and monitoring indicates additional forage is available to meet the full preference demand of 1224 AUMs. Allocate additional forage to livestock under the provisions and procedures of 43 CFR 4100.

Grazing Preference, Available Forage, and Livestock Allocation

Grazing Preference

Current grazing preference by permittee is as follows:

Permittee Name	Total Preference AUM's	Active Preference AUM's	Suspended AUM's
Kiely Bros.	877	661	216
W. C. Laird	415	326	89
McKee Ranch	390	304	86
M. Anderson	365	365	0
Totals	2,047	1,656	391

Proposed grazing preference by permittee is as follows:

Permittee Name	Total Preference AUM's	Active Preference AUM's	Suspended AUM's
Kiely Bros.(1)	0	0	
W. C. Laird(2)	469	469	
McKee Ranch(3)	390	304	86
M. Anderson	365	365	0
Totals (4)	1,224	1,138	86

Note:

(1) Kiely Brother's preference will be shifted to the Alkali Winter allotment.

(2) Includes 54 AUM's of mitigation from the plan ammendment removal of 54 AUM's from the Laird (507) allotment.

(3) The BLM will recognize McKee Ranch's existing preference, but hold all but 88 AUM's of that preference in a temporary non-use status, until additional forage is developed within the Flagstaff Bench Area and monitoring data indicates the forage is available. The historical use, primarily for trailing and gathering purposes will continue to be authorized against the active preference not to exceed 88 AUM's.

(4) The total livestock interim preference will be 922 AUM's (Laird-469, Anderson-365, McKee-88).

Available Forage

The plan amendment removed 734 available livestock AUMs from the allotment and the respective livestock preference of 1656 AUMs, leaving a livestock forage base of 922 AUMs. This available forage is conservative based upon additional acres within the allotment from the acquisition of 693 acres of uplands, of which there is 250 acres of improved rangelands (crested wheatgrass seedings), and there is also 1,126 acres of U.S. Fish and Wildlife and Oregon State lands. The livestock capacities of these lands will be incorporated and managed by the BLM through land exchanges and memorandum of understandings.

Livestock Allocation

Interim livestock forage allocation for the Warner Lakes Allotment (grazed area) is as follows:

Active Preference	Non-Use	Total Preference
922	302	1,224

Full implementation livestock forage allocation for the Warner Lakes allotment (grazed area) is as follows:

Active Preference	Non-Use	Total Preference
1,224	0	1,224

The existing forage base available (922 AUMs) will not meet the remaining unsatisfied preference of 302 AUMs for full implementation of this AMP (McKee's

active preference of 304 AUMs plus McKee's suspended non-use of 86 AUMs, minus the 88 AUMs remaining forage from the available base of 922 AUMs). A proposed land treatment on Flagstaff bench will satisfy the total preference demand and implement the grazing system once completed.

Grazing Management Problems

Fluctuating water levels: The most striking management problem in the Warner Lakes allotment is the fluctuating water levels in the sloughs, channels, ponds and lakes. Livestock have little access to these areas on high water years and gathering of livestock is difficult during these periods.

Lack of management facilities: The lack of interior fencing creates uneven livestock distribution. This distribution problem coupled with fluctuating water levels may affect plant vigor, composition and density of desirable species in isolated areas where livestock congregate.

Additional watering facilities need to be developed to distribute livestock properly. Without additional watering facilities the livestock will continue to congregate around sloughs, channels, ditches and ponds and not utilize the upland vegetation available.

Noxious weeds: An increasing population of *Salvia aethiopis* (Mediterranean sage) is present in the Flagstaff bench area of the allotment. This community may present a problem in the future because of its ability to dominate a site over time.

Acreage, Ownership and AUM's by Pasture

Pasture Number	Pasture Name	Ownership				Total Acres
		Public	USF&W	DSL	Private	
01	North	9,566	0	101	1,264	10,931
02	Middle	4,745	0	0	383	5,128
03	Well	2,704	0	0	0	2,704
04	East Bench	655	133	0	0	796
05	West Bench	828	6	168	0	941
06	Seeding	596	0	160	0	596
07	South	346	558	0	0	1,117
Totals		19,440	697	429	1,647	22,213

Grazing Management Systems

The grazing systems proposed are designed to meet the growth requirements of the plants during the critical period (May and June), in order to improve the composition, vigor and density of the present range site plant communities. Two grazing treatments have been chosen and will be used in specific pastures.

Deferred Grazing

This treatment will be used in the North and Seeding pastures annually. Deferred grazing would begin before the critical growing period or after seed ripening on key species annually. Utilization targets of the

annual forage production of key species will be 50%. This treatment allows for restoration of plant vigor and seed production while maintaining or improving plant health. Litter and seed trampling would also occur under this treatment.

Rest Rotation Grazing

Rest rotation grazing is a rotation system in which at least one pasture within the grazing system is rested from grazing for a minimum of a full year. The pasture is rested from use after a season of grazing to allow plants an opportunity to manufacture and store carbohydrate food reserves to recover vigor, increase seed production, allow seedlings to become established, and allow litter to accumulate between plants.

Grazing Formulas and Treatment Schedules

The following grazing formulas and grazing schedules are designed for three individual use areas (Anderson, Laird, and McKee):

Anderson

Grazing Formula

Treatment	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
A		////////////////////(Graze 4/01-10/15)////////////////////							
B		----- REST -----							
C		////////////////////(Graze as Needed)////////////////////							

Note: The grazed pasture will only be used to 50–60 percent utilization of key species. The balance of this preference will come from the seeding pasture if needed.

Grazing Schedule 4/01-10/15

Year	Well Pasture	Middle Pasture	Seeding Pasture
1 and 2	A	B	C
3 and 4	B	A	C

Note: If the Well or Middle pasture does not meet the demand within the proper utilization levels, turnout for April use can be made in the Seeding pasture, moving to the Well or Middle pasture later in the grazing season .

Laird

Grazing Formula

Treatment	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
-----------	-------	-------	-----	------	------	------	-------	------	------

A	////////(Graze 7/01-10/15)////////								
---	------------------------------------	--	--	--	--	--	--	--	--

Grazing Schedule: Treatment A each year.

McKee

Grazing Formula

Treatment	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
-----------	-------	-------	-----	------	------	------	-------	------	------

A	/////Graze/////								
B	/////Graze/////								
C	Rest								

Treatment A: To be grazed from 3/15-4/30.

Treatment B: To be grazed from 3/15-4/30 and from 9/01-10/15.

This treatment is to accommodate trailing and gathering use.

Grazing Schedule

Year	East Bench	West Bench	South Bench
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1	A/B	C	C
2	C	A	B

Normal Operation

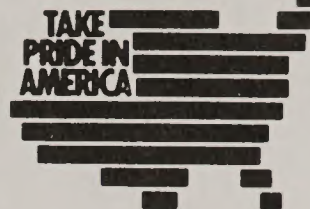
This allotment will consist of seven pastures used by three permittees. Once the proposed range improvements are constructed or developed, each permittee will be separated from each other within the allotment. Cattle numbers and season may vary as long as they are within the season of use parameters and preference AUMs set forth in this AMP. The summary below diagrams the normal operation under the fully implemented AMP.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

LAKEVIEW DISTRICT OFFICE
P.O. BOX 151 (1000 Ninth Street S.)
Lakeview, Oregon 97630



IN REPLY REFER TO

1617

April 30, 1990

Dear Reader:

Enclosed for your review is the Draft Warner Wetlands Area of Critical Environmental Concern (ACEC) Management Plan. The planning area is that portion of the public lands in the Warner Valley designated as an ACEC by the Warner Lakes Plan Amendment for Wetlands and Associated Uplands (Plan Amendment, May 1989) in the Decision Record signed by the Oregon State Director on September 29, 1989. This is the Draft activity plan mentioned in the cover letter to the Decision Record. It is being sent to all participants in the Warner Wetlands ACEC planning effort.

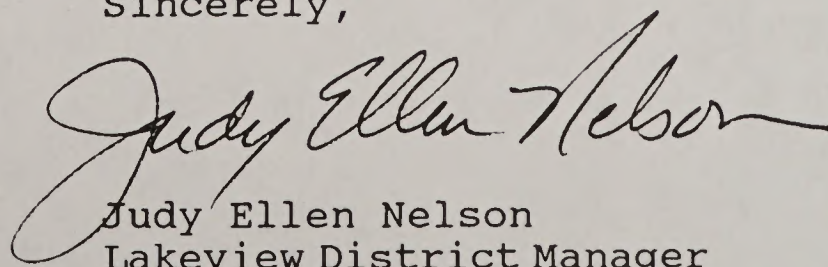
The Draft ACEC Management Plan contains sections dealing with the management of the primary resources and uses in the planning area. Sections are included on wildlife, range, recreation, cultural resources, geology, and botany which are condensed versions of longer, free-standing activity plans for each resource or use. We have also prepared a draft environmental assessment for the ACEC Management Plan. In total, these documents define and analyze management direction and actions to implement the Plan Amendment within the ACEC. It was developed using public participation in combination with the professional knowledge and experience of BLM staff members.

As a Draft, we are asking for further public comments and ideas regarding the future management of the Warner Wetlands, within the constraints of Plan Amendment. Please submit your comments and ideas by June 15, 1990 to:

Lakeview District Manager
P.O. Box 151
1000 S. 9th Street
Lakeview, Oregon 97630

Your interest and participation in the Warner Wetlands planning effort is appreciated.

Sincerely,


Judy Ellen Nelson
Lakeview District Manager

Pasture Name	Year	March	Aprll	May	June	July	Aug.	Sept.	Oct.	Nov.
North	1					//////////Laird//////////				
	2					//////////Laird//////////				
Middle	1*		//////////Anderson//////////							
	2*		//////////Anderson//////////							
	3					REST				
	4					REST				
Well	1					REST				
	2					REST				
	3*		//////////Anderson//////////							
	4*		//////////Anderson//////////							
Seeding	1*					//////////Anderson//////////				
	2*					//////////Anderson//////////				
E. Bench	1		//////McKee//////					//////McKee//////		
	2					REST				
W. Bench	1					REST				
	2		//////McKee//////							
South	1					REST				
	2		//////McKee//////					//////McKee//////		

Annual Use (AUM's)

Laird	469
Anderson	365
McKee	<u>390</u>
Total	1,224

The special terms and conditions of the grazing authorization are considered a part of the normal operation of this AMP. These terms and conditions are:

1. Your actual use report is due 15 days after the end of the grazing season in all allotments.
2. You are required to perform normal maintenance on the range improvements to which you have been assigned maintenance responsibility.
3. As of 4-28-1988, the regulations regarding the payment of grazing fees have changed. As in the past, the payment of your grazing fees is due on or before the due date specified in the grazing bill. If your payment is not received within 15 days of the due date, you will be charged a late fee assessment of \$25 or 10 percent of the grazing bill, whichever is greater, not to exceed \$250. Failure to make payment within 30 days of the due date may result in trespass action.
4. No salt and/or mineral blocks shall be placed anywhere within the allotment without prior approval from BLM. Those salting and/or mineral block locations that will be approved must be more than 1/4 mile from livestock water, springs, meadows, or streams. Exceptions to the 1/4 mile limit may be granted if topography and/or available water sources do not allow for the 1/4 mile requirement.
5. No supplemental feeding may occur without prior approval of the proposed feeding location (includes trailing) from the BLM.
6. Livestock grazing use is to be made in accordance with the Warner Lakes Allotment Management Plan.

Flexibility

Maximum flexibility of season-of-use and livestock numbers without prior approval is as follows:

- Livestock numbers may vary within the season-of-use specified in the annual turnout authorization by 10 percent without prior authorization. This flexibility does not authorize any use above active preference without prior approval by the BLM.
- The flexibility for an earlier or later turn-out will be + or - 10 days from the normal turn-out date without prior approval from the BLM.
- Use of all pastures will be as outlined in this AMP. There may be occasions when a particular pasture has to be rested for two consecutive years or longer, such as to protect seedings, controlled burns, prolonged drought, instances where it takes longer than two years to establish cultural treatments, etc. This would require some voluntary non-use and adjustments to the grazing systems. Any alteration to the schedules set forth in this AMP needs to be pre-approved in advance.
- Any increases or decreases in available forage will be based on sufficient monitoring data. Non-renewable grazing use may be authorized by the BLM when monitoring data shows additional forage may be temporarily available. Additional forage found to be permanently available through monitoring will be allocated according to 43 CFR 4100.

Interim Grazing Management

The AMP grazing system will not be fully implemented until all essential projects are completed. This is contingent on BLM funding levels and other funding sources. The following discussion and summary explains the interim grazing plan for this AMP.

After fencing is completed, the North, Middle and Well pastures will be used as addressed in the preceding grazing formula and treatment section. The only portion of the grazed area that would be under an interim grazing system then will be the South, West Bench and East Bench pastures and would impact Mr. McKee's operation, with the other permittees not being impacted to any significant degree.

Roy Anderson will be allowed to use the Seeding pasture to complete his active preference annually once target utilization levels have been reached on key species in his scheduled pasture (the Middle or Well pasture). McKee will continue to take partial voluntary non-use on the other pastures in the McKee use area until the proposed land treatment is completed and the seeding becomes established. Some use will be made by McKee (up to 88 AUMs) while trailing and gathering to and from their Hart Mountain summer range.

Summary of Interim Grazing Plan

Pasture Name	Year	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
North	1					//////////Laird//////////				
	2					//////////Laird//////////				
Middle	1*		//////////Anderson//////////							
	2*		//////////Anderson//////////							
	3					REST				
	4					REST				
Well	1					REST				
	2					REST				
	3*		//////////Anderson//////////							
	4*		//////////Anderson//////////							
Seeding	1*					//////////Anderson//////////				
	2*					//////////Anderson//////////				
E. Bench	1					REST Pending development				
	2					REST Pending development				
W. Bench	1					REST Pending development				
	2					REST Pending development				
South	1	/////McKee/////						/////McKee/////		
	2	/////McKee/////						/////McKee/////		

Annual Use (AUM's)

Laird	469
Anderson	365
McKee	<u>88</u>
Total	922

Mitigation and Land Exchanges/ Acquisition

Mitigation: The Warner Lakes Plan Amendment proposed action will remove 661 AUMs of active preference and 216 AUMs of suspended non-use from the Warner Lakes Allotment. Planned mitigation of this removal of preference is as follows:

Remove all of Kiely Brother's preference from the allotment and offer for age in the Alkali Winter (1001) allotment which already exists and is in excess of the preference of the present operators. The mitigation is based on an AUM for AUM basis.

Other options for mitigation: Refer to Warner Lakes Plan Amendment for Wetlands and Associated Uplands, Mitigating Measures on page 31 for other alternative options for mitigation.

Land Exchanges/Acquisition: The Division of State Lands (DSL) and the BLM have completed land exchanges over the past several years and are actively pursuing another that will remove the remaining state lands from the allotment.

As well as land exchanges, the acquisition of privately owned lands within the allotment is also being pursued. Several acquisitions have been completed and the acquisition of additional lands remains a possibility. Acquisitions completed this past year will add approximately 250 acres of crested wheatgrass seeding to the Flagstaff Bench (grazed) area and will allow for more intensified management with the grazing system.

Planned Projects

Project Name	Location
Turpin Well	T.33S.,R.25E.,Sec. 35 NENE
Flagstaff Well	T.34S.,R.25E.,Sec. 17 SWNE
Bench Well	T.35S.,R.25E.,Sec. 9 SENE
Swamp Well	T.35S.,R.25E.,Sec. 20 NWSE
Turpin Cattleguard	T.34S.,R.25E.,Sec. 2 NWSE
Bluejoint Cattleguard	T.34S.,R.25E.,Sec. 4 SWSE
Flagstaff Cattleguard	T.34S.,R.25E.,Sec. 31 SWSW
Gravel Pit Cattleguard	T.35S.,R.25E.,Sec. 9 NWSW
3-C Cattleguard	T.35S.,R.25E.,Sec. 16 SWNE
Anderson Cattleguard	T.35S.,R.25E.,Sec. 20 SESE
Swamp Cattleguard	T.35S.,R.25E.,Sec. 20 NENW
Refuge Road Fence	See Enclosed Map
Native Fence	See Enclosed Map
Seeding Fence	See Enclosed Map
Bench Division Fence	See Enclosed Map
North Flagstaff Fence	See Enclosed Map
Turpin Fence	See Enclosed Map
Flagstaff Bench Burn & Seed	East and West Bench Pastures

Planned Project Cost Estimates

Fencing			
24.25 miles @	\$2,000/mile	=	\$ 48,500
Wells and pipelines			
4 @	\$15,000 each	=	\$ 60,000
Cattleguards			
7 @	\$ 5,000 each	=	\$ 35,000
Commercial or Generator			
Power for Wells			
4 @	\$10,000 each	=	\$ 40,000
Flagstaff Bench			
Burn and Seed 1,200 acres			
@	\$50/acre	=	\$ 60,000
Total		=	\$243,500

Highest priority will be given to water and fencing developments. Additional projects may be added to this AMP as a need is identified. All projects will be implemented after consultation with the permittees and affected interests.

Studies and Evaluations

Studies

Ecological Site Inventory, Climate, actual use, utilization, photo trend, nested plot frequency and 180 degree step toe trend transects are all studies to be used in measuring vegetative responses to management under this AMP. Climate data will be used to correlate actual use and utilization readings. Actual use will be submitted by each permittee within 15 days of the end of grazing use in the allotment. Utilization will be read annually for each pasture used. Trend and frequency studies will be read every five years.

Additional long term range trend studies will be established in the allotment, one for each pasture. These studies will use nested plot frequency to monitor the trend of key species and will be established by an interdisciplinary team.

These studies exceed the minimum requirement for monitoring as established in the Oregon/Washington Rangeland Minimum Monitoring Policy and Handbook.

Evaluations

Annual allotment write-ups will be completed covering the general aspects of the allotment. More extensive allotment evaluations will be conducted periodically to monitor the overall effectiveness of this AMP in meeting its objectives. Periodic tours will be made with the range users to discuss various aspects of the AMP and to determine range improvement needs with regard to maintenance and new construction.

Warner Wetlands Recreation Area Management Plan

Introduction

National attention has focused on the wetland resources of our nation, their importance for wildlife habitat, ecosystem diversity and recreation. National expenditures for photography and observation of wildlife alone, exceed \$10 billion annually. The Warner Valley has long been recognized as a valuable wetland resource.

Nestled beneath the dramatic face of Hart Mountain, the Warner Wetlands present a truly unique complex of features. The larger lakes are bound on the north by the sweeping curvature of lunate dunes formed by the prevailing winds. A maze of channels interconnects the lakes, in a serpentine display reminiscent in wet years of the bayou complex of the Mississippi river delta. Marshes come alive with the thunder of wings as birds by the thousands take to the air. Young ducks trail from the nest, practicing camouflage techniques amongst dense reeds and green tunnels of vegetation. Cranes strut upland fields, tall sentinels standing guard over habitat shared with long-billed curlew. Remarkably, Warner Wetlands is not near a large river, or ocean, but in the high desert of eastern Oregon.

The Warner Wetlands are a model for dynamic and diverse natural processes. Lakes that support crappie fishing one year, may be completely dry the next. The cyclic pattern of alternate drying and flooding creates a complex and constantly changing habitat for plants and wildlife. This same diversity and change provides an attractive setting for recreation.

Birdwatching opportunities are year-round. Spring and fall migrations bring hundreds of thousands of birds through Warner Valley. Waterfowl hunting occurs in fall and early winter. Fishermen are lured to the larger lakes in all years, with cyclic activity on the shallow lakes in the north end of the wetland area. Hiking, canoeing, sightseeing, and a broad spectrum of outdoor recreation activities are available to suit a diversity of interests. The Warner Wetlands will also provide semi-primitive recreation opportunities for disabled individuals who seek the out-of-doors and some degree of challenge.

Recreation opportunities in the Warner Wetlands compliment those found on surrounding lands. Hart Mountain National Antelope Refuge to the east provides mountain peaks, a hot spring, wildlife viewing, and scenic vistas. The Oregon State Gemstone, the Sunstone, can be collected in a special area set aside for public use a few miles to the west. Pine forests and mountain meadows are only a few minutes to the southwest. The Warner Wetlands and surrounding lands bear evidence to over 10,000 years of human history. It is written on rocks, evidenced by traces of pioneer roads, and displayed in artifacts of human passage.

Recreation Use in the Management Area

The setting for recreation activities in the Warner Wetlands Recreation Area Management Plan (RAMP) Area ranges from rural with fields, ditches, and major roads nearby, to roaded natural, to semi-primitive motorized. A large portion of the management area offers semi-primitive opportunities where motorized access on designated roads and trails is available in an area also providing a high degree of contact with natural environments, and solitude.

Recreation use is currently occurring at a rate of about 12,000 visits per year, divided primarily between hunting, fishing, and sightseeing. Bird watching, boating, and camping are also important uses. Concentrated hunting and fishing use is seasonal, with hunting occurring mainly in the fall and fishing primarily in the summer months. Fishing is also variable from year to year, based largely on the quality of the crappie fishing. Users are primarily from Oregon, although about 35 percent are from out of state. The highest out of state use is made by hunters from California. The largest increases in use are in sightseeing, particularly birdwatching.

In spite of the present use levels and what appears to be a trend to increased use, there are no recreation facilities. Lack of facilities and recreation management presence has resulted in sanitation problems, off road vehicle damage, and limited access for some.

Recent acquisition of wetlands through the Land and Water Conservation Act Fund has consolidated federal ownership in valuable recreation use areas and at key access locations. Public access has been improved to meadows north of Hart Lake and to the shorelines of Flagstaff and Campbell Lakes.

Visitor use is expected to increase as a result of developments to enhance wildlife habitat, and thus wildlife numbers. Development of visitor facilities may also attract some users not presently visiting the area. Development of trails and facilities particularly suited to the disabled community will likely draw visitors from a nation-wide user base.

The area will also receive added publicity as a result of the Lakeview to Steens Back Country Byway in 1989, as part of a national program to facilitate pleasure driving in scenic areas on BLM lands. The Warner Wetlands are also featured in the Oregon Watchable Wildlife Program initiated by the Defenders of Wildlife and have been established as a Special Recreation Management Area within BLM's Recreation 2000 effort.

In summary, use is conservatively projected within the next 10 years to increase to 19,250 visits per year. Use would increase with changes in management practices, increases in public interest and awareness, improved recreation opportunities for a more diverse group of users, and improved facilities and access. With all the factors potentially causing increased use, use could reach levels as high as 60,000 visits per year.

Planning Guidelines and Management Objectives

The Final Decision for the Warner Lakes Plan Amendment for Wetlands and Associated Uplands (1989) established the Warner Wetlands Area of Critical Environmental Concern (ACEC) containing 51,045 acres of BLM administered public land. The ACEC was established to emphasize the preservation and protection of unique wildlife, ecological, cultural and geological values.

Three different site specific management goals were established for the five management areas within the ACEC. On the Core Wetlands--Acquired and Potholes (30,125 acres), the management goal is to improve wildlife resource values and exclude conflicting uses. In the Meadow Management Area (420 acres), the management goal is to place primary emphasis on wildlife habitat condition or enhancement while providing opportunities for other uses. In the Grazed Areas--Potholes and Flagstaff Bench (20,500 acres), the management goal is to provide for increased livestock forage production while improving the composition, vigor, and density of the present range site plant communities.

The overall framework of the recreation management program has been planned to be consistent with protection of ACEC values and attainment of the Plan Amendment management goals. For example, general recreation use and maintenance activities may occur, but vehicle use off roads and trails may not. Commercial recreation uses under a BLM Special Recreation Permit (such as guided tours), or development of recreation facilities, may occur if they do not cause significant adverse impacts to ACEC values.

The primary goal within the recreation program is to provide a broad spectrum of recreation opportunities which compliment the management objectives for the Warner Wetlands, particularly for wildlife. These recreation opportunities will also incorporate barrier-free facilities and design to accommodate the disabled members of our society who seek outdoor recreation and some degree of challenge. Recreation developments will be attuned to the natural environment and its protection, with minimal visual impact, and little or no functional impact on the ecosystem.

The objectives for this RAMP are to:

- Provide within five years of implementation, a broad spectrum of recreation facilities and programs which compliment, or are consistent with, the wildlife, vegetation, and cultural resource management objectives. Developments will be attuned to the natural environment and its protection, with minimal visual impact, and little or no functional impact on the ecosystem.
- Provide within five years of implementation, interpretive facilities which will enhance the visitors understanding of wetland ecosystems, while protecting those natural systems from the potentially negative effects of human use.
 - Within five years after implementation, provide access and facilities for disabled visitors seeking an outdoor recreation experience that offers a degree of challenge. For those more severely disabled, provide barrier-free access for the enjoyment of substantial areas of the Warner wetlands experience, while preserving natural resources.
- Maintain, through development and operations, the Recreation Opportunity Spectrum (ROS) classes commensurate with overall management objectives for the Plan Amendment and the ACEC.
- Monitor changes in visitor numbers and use patterns, along with the function of recreation developments, to adapt or revise recreation plans to facilitate Plan Amendment, ACEC, and recreation objectives.

The Management Program

Monitoring

Monitoring related to Plan Amendment and ACEC objectives will be provided by the Wildlife, Botany, and Archeology programs, and will help guide the implementation or modification of recreation proposals. Examples of such monitoring programs include: studies of vegetation change in recreation use areas, waterfowl nesting density, brood success, nesting success, and disturbance of archaeological sites. Potential indicators would be: change in nesting density, decline of vegetation, observed rate of change in recovering natural systems, or an observed decline at a cultural site due to recreation use.

Recreation monitoring of access and visitor use will then be used to characterize visitor use that occurs and prescribe management measures to assure that Plan Amendment and ACEC objectives are met. A formal recreation monitoring plan for the ACEC will be established within three years of implementation. The analysis of recreation use levels, use distribution, and type of use would be combined with the monitoring data from other specialists referenced above. Techniques to collect recreation use data would include photo trend locations, use of vehicle counters, direct observation, and direct sampling through visitor contact and registers.

Planned Projects

Recreation projects are outlined by development area. Funding, and final environmental clearances for each project, could affect the actual implementation of individual projects.

Primary Access: Existing BLM road access will need to be upgraded on the east side of the Warner Wetlands to the north end of Campbell Lake. On the west side of the area approximately eight miles of road 3155C will be constructed or reconstructed to allow all weather access to Turpin Lake.

The Lake County Road Department is currently involved in paving and upgrading road access to Hart Mountain on County Road 3-12, which will also improve access to key recreation sites. County Road 3-10 (Hogback Road) is also being improved from Plush northward. County planning would address in out years improvement of road 3-11, which connects these two major access routes.

Campbell Lake: Develop a camping area on southeast corner of the lake for recreation vehicles and trailers. A boat ramp will be placed on the east side of the lake to accommodate launching of small boats and parking for boat trailers. A small campground will be developed for tent campers on flats north of the boat ramp location. Vehicle trails will be constructed to contain use and protect habitat along the lake-shore. No potable water source is planned at this site but water will be available at Hart Lake and the Mugwamp Trail Complex. Tables, pedestal barbecue boxes, and restrooms will be provided.

Turpin Lake: Develop the northwest corner of lake with a small (3-5 unit) semi-primitive campground. Tables, pedestal barbecue boxes, and a restroom will be provided. A barrier-free interpretive trail with appropriate rest stops and shade structures will be developed from this location southward along the lake and channel system for approximately one mile. A boat ramp to accommodate small boats will be placed at the northwest corner of the lake. The Turpin Lake facility will be designed as barrier-free, to include interpretation, camping, and access to the canoe trails in the channels between the lakes. It should be noted, however, that this development will be in a semi-primitive setting, and therefore, all amenities found in an urban environment will not be available. A brochure describing all features and giving guidance to potential users will be prepared and available on request.



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Flagstaff Lake: A boat ramp, restroom and small primitive camping area with vehicle pads, barbecue boxes, and a few tables are proposed for the west side of Flagstaff Lake. This development will provide boat access to the lake chain and provide camping for self contained recreation vehicles which commonly use this location at the present time.

Mugwump/Swamp Lake Complex: Facilities at this location will include a parking area, potable water, restroom, picnic and shade facilities and a trailhead for a trail system offering access to the various wetland habitat types associated with the Warner Wetlands. The trail system will be designed as barrier-free, however, it should be noted that varying levels of challenge will be presented within the approximately 4-5 miles of trail to be constructed. Guidance will be provided at the parking area to describe the trail system and the varying terrain and distance on several loops, so that the individual visitor can assess the level of challenge presented.

(Special Note: This site lends itself to the relatively new class of user who will seek an essentially undeveloped recreation experience, who will attempt to cope with the challenge of visiting a semi-wilderness or wild area, using heightened physical abilities and improved adaptive equipment to compensate for the absence of special accommodations.)

Lake Channels, Core Wetland Area: The lakes and the extensive channel system between and west of the lakes offers a unique opportunity to study and enjoy this very special area by canoe or small boat. Portions of the channel system lend themselves well to accommodating disabled users in canoe, kayak, or similar vessels. (See special note above.)

Canoe or small boat trails will be designated and signed on approximately eight miles of trail with an accompanying brochure and taped interpretive program. Power boats would be allowed on this 8 mile segment, however, the channels do not lend themselves to larger boats with motors.

Depending on the water cycle, the channel system would provide up to an additional 400 miles of channels forming winding and convoluted waterways through the lands between and west of the lakes. The potential exists to identify additional miles of signed trail and interpretation on these channels when conditions warrant.

Core Wetlands, Acquired: Acquired lands north of the Hart lake bar and south of the Mugwump complex are suited to recreation access along existing, or proposed reconstructed dikes necessary for habitat management. Dikes will provide approximately seven miles of barrier-free access. Motor vehicles will be allowed only on major dike roads.

At Hart Lake Bar, a contact station with parking, interpretive facilities, water and restrooms will be located adjacent to the existing county road. This facility will provide wildlife observation opportunities and materials to guide the arriving visitor to other locations and facilities in the Warner Wetlands and surrounding lands.

Hart Mountain and Hart Mountain Slide Overlooks: An interpretive site will be built on the bench approximately two-thirds of the way up Hart Mountain on the road to the Refuge Headquarters. The site will incorporate a small parking area and short barrier-free trail to an overlook of the Warner Valley. The site will incorporate plaques near ground level along a trail which locate features of the Warner Valley.

Adjacent to County Road 3-12 a similar overlook site will be built to the north and east of Anderson Lake. This site will interpret significant geologic features of the valley, with special attention to the large hummocks and dunes that resulted from a large slide of material from Hart mountain into the valley below.

Off Site Facilities: The old Civilian Conservation Corps (CCC) camp located at the base of Hart Mountain, near the junction of county roads 3-12 and 3-11 presently receives use by BLM-sponsored educational groups. This site, among others, offers potential for environmental education or interpretation. This facility is administered by the U.S. Fish and Wildlife Service.

Any cooperative effort by BLM and USFWS to use the facility would need to ensure that historical values present were protected or enhanced. Due to the age of existing structures, upgrading, or reconstruction may be needed on existing historical structures. At the present time the facility does not have adequate sanitary facilities or water. The east shoreline of Hart Lake offers similar potential for off site facilities, as well as access to the lake. A potential site in the vicinity of the CCC Camp or Hart Lake would provide about 20 camping spaces without encroaching on the historical existing structures. Such a site is planned for about the fifth year of the plan to serve increased overnight use outside the ACEC. The final site will be determined through further planning.

Interpretive Signing and Materials: Limited conventional signing will be used to provide directions and interpretive messages to users. With the overriding goal of preserving natural appearances and processes in the area, signs and other facilities will be designed to limit visual impacts to the landscape. Brochures will be prepared to address overviews, as well as resource specific interpretation. Interpretive materials such as cassette recordings, and alternate format printed materials, will also be prepared to expand the user audience.

Projects and Cost Estimates

Recreation projects are currently planned for key visitor use areas. Additional interpretive facilities will be dispersed through the area where visitor access is available and use occurs in substantial enough numbers to warrant expenditures. Increased use in out-years that exceeds capacity of the planned facilities would require development of facilities outside the ACEC. Operations costs shown below include salaries to administer project work and recreation use. The implementation of several projects involving facilities construction is phased to allow for adequate survey and design. As a result, funding is planned over a series of years. The following expenditures are anticipated in the first ten years:

Year 1	
Operations	\$ 59,000
Roads, Trails, and Signs	103,000
Hart Lake Bar	49,500
Campbell Lake	15,000
Turpin Lake	5,000
Swamp Lake Complex	<u>38,000</u>
Total Year One	\$269,500

Year 2	
Operations	\$ 66,000
Roads	56,000
Overlooks	30,000
Turpin Lake	45,000
Canoe Trails	8,000
Swamp Lake Complex	27,000
Acquired Lands Trails	<u>23,000</u>
Total Year Two	\$255,000

Year 3	
Operations	\$ 69,000
Campbell Lake	8,000
Flagstaff Lake	16,000
Turpin Lake	10,000
Swamp Lake Complex	28,000
Stone Corral Lake	36,000
Acquired Lands	<u>15,000</u>
Total Year Three	\$174,000

Year 4	
Operations	\$ 79,000
Signing and Maint. Projects	<u>38,000</u>
Total Year Four	\$117,000

Year 5	
Operations	\$ 79,000
Off Site Projects	<u>52,000</u>
Total Year Five	\$131,000

Years 6 and 7	
Operations	\$ 158,000
Major Facility Maint. Effort	<u>48,000</u>
Total Years 6 and 7	\$206,000

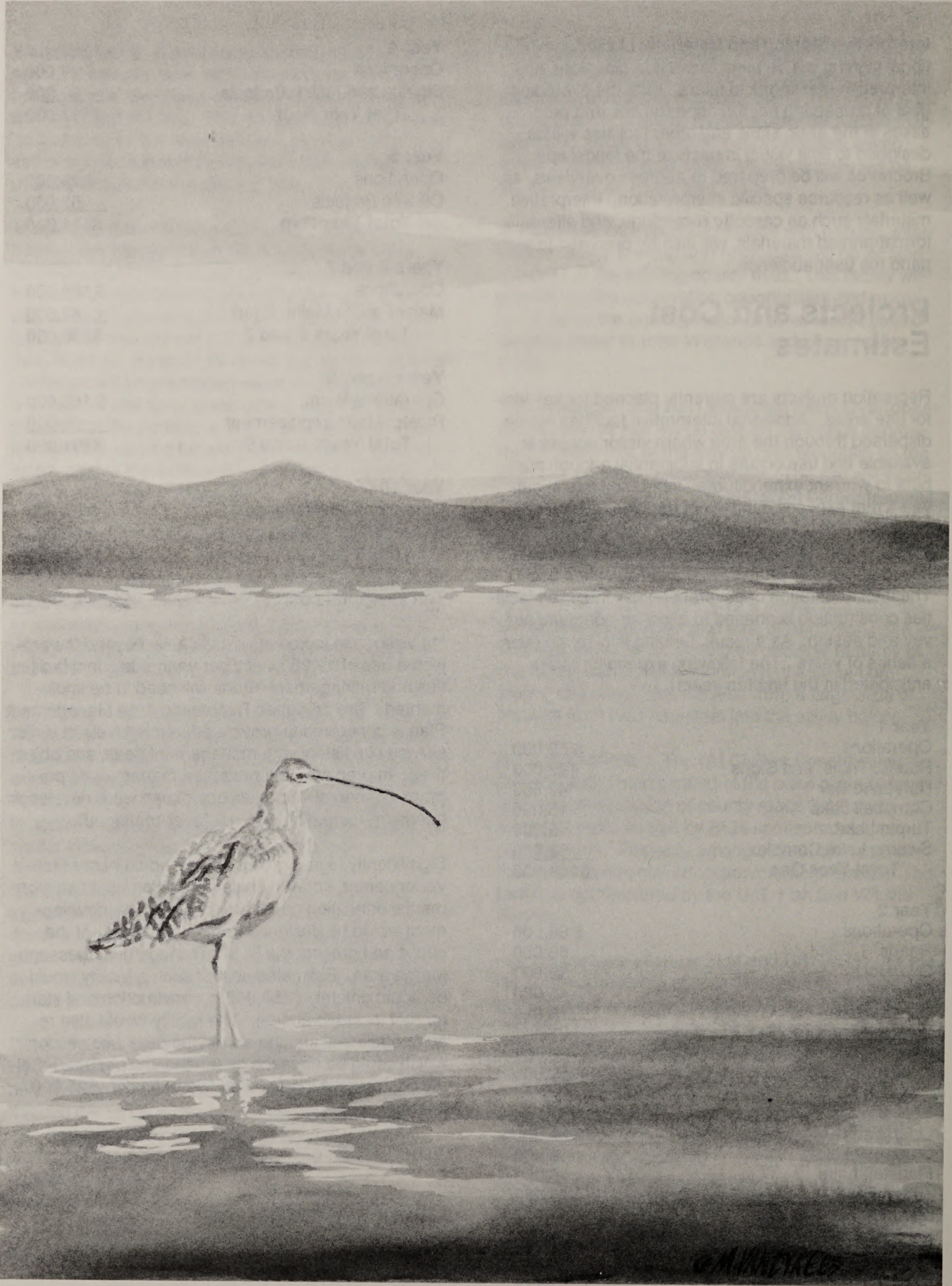
Years 8 and 9	
Operations/Maint.	\$ 163,000
Project Maint./replacement	<u>28,000</u>
Total Years 8 and 9	\$191,000

Year 10	
Operations/Maintenance	\$ 84,000
Project Maint./Replacement	<u>60,000</u>
Total Year Ten	\$144,000

Ten year total cost	\$1,489,000**
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**If visitor use increases significantly beyond the projected use of 19,250 visits per year, additional facilities and management efforts will need to be implemented. The proposed Recreation Area Management Plan is conceived to provide adequate levels of visitor service consistent with management goals and objectives. In preparing the proposed management program, conservative projections of use were developed to ensure recreation was not "over-managed".

Significantly higher growth in use would necessitate a visitor center, small in scale to function as an environmental education and visitor center. This development would be designed to meet the needs of the public and present the BLM's management message for the area. Estimated cost of such a facility would be approximately \$250,000 in construction and start-up (not included above). The facility would also require additional staffing during the peak use season, which could be as much as ten months per year. Salary costs would increase by approximately \$25,000 per year.



Warner Wetlands Cultural Resources Management Plan

Introduction

Man first settled in the basin to be known as the Warner Valley at least ten thousand years ago. This was a time of general warming and drying in the Great Basin; glaciers were receding, the vast Pleistocene lakes were shrinking, and the sagebrush steppe desert was creeping over thousands of square miles. These first residents sited their camps and activities around the lakes and marshes of the valley floor. They may have been drawn there by the dark clouds of waterfowl rising over the marshes, or by the aquatic life teeming in the lakes and streams, or maybe by the seemingly endless natural fields of wild grains and tubers. Whatever the reason, these stone age homesteaders lived and died in the valley for twenty-five hundred years with little change to their culture - or at least in the surviving artifacts of that culture.

These artifacts define what is known to Great Basin archeologists as the "Early Period" of occupation, and it lasted until about 7,500 years ago. Among the more common artifacts are large, leaf-shaped stone points which seem to have been used primarily as tips for heavy thrusting spears. Milling stones, sagebrush sandals, scrappers, knives and stone drills have all been found associated with "Early Period" sites.

Slowly, over centuries perhaps, the "Early Period" culture changes with the changing environment, to become the "Archaic Period". Moist conditions seem to prevail on the uplands, where grasses come to dominate the sagebrush steppe. The heavy thrusting spear points are replaced by smaller points used to tip light javelins or darts that were hurled with the aid of an atlatl, or spear-thrower. The people of this period ranged more widely than before, using the surrounding uplands as well as the valley floor. This life-style continued for about the next six thousand years, until roughly 1,500 years ago.

Once again the stone tips of hunting weapons give an indication of ongoing cultural changes. Small points made for use with the bow and arrow replace the javelin points of the earlier age. Many of the stone tools continue to be made as in prior days, and it is assumed that many of the cultural traits from the two earlier periods persisted.

Then, about 500 years ago, the valley was occupied by a people not too unlike those who had lived in the valley before; but a people to whom we can give a name - the Northern Paiute. From then until the settlement of the valley by Euroamericans in the 1800's, the Warner Valley was home to members of that tribe of Native Americans. Even today, Northern Paiutes use the valley for hunting, plant gathering, visiting graves and religious activities.

Compared to the sedate pace of the previous millenniums, the historic period in the Warner Valley is a hectic flurry of trappers, explorers, cavalry, and settlement. John Fremont's 1843 expedition of exploration follows hot on the heels of Peter Skene Ogden's 1827 trapping expedition for the Hudson's Bay Company. Military wagon roads and cavalry forts follow with dazzling speed, bringing homesteaders, ranchers and farmers in their wake. In a figurative blink of the eye, the valley has electricity, automobiles, television, and all of the other cultural artifacts of twentieth century civilization.

The cultural remains of a hundred centuries of human occupation can be found in the Warner Valley, remains that are at risk of being destroyed in our rush to progress. It is towards preserving this heritage, and, in preserving, to learn and understand what has gone before, that this activity plan is directed.

Planning Guidelines

The Warner Lakes Plan Amendment for Wetlands and Associated Uplands, issued in May, 1989, contains a Proposed Action for the management of public lands in Warner Valley. This Proposed Action contains specific management objectives for the use and/or protection of the wildlife habitat and livestock forage resources, and more generalized directions for Area of Critical Environmental Concern (ACEC) values; one of which is cultural resources.

The ACEC boundary identified in the Plan Amendment is the boundary being used for this activity plan. The management goal within the ACEC, to which all resource uses must conform, is to "Emphasize the preservation and protection of unique wildlife, ecological, cultural and geologic values...". Unlike the wildlife habitat and livestock grazing sections of this activity plan, and the Plan Amendment to which it is tiered, separate management areas with differing goals and objectives have not been identified for cultural resources. The same, high level of protection and preservation for cultural resources will be applied to all portions of the ACEC. As private and/or state lands are acquired within the ACEC boundary, they will be managed under this goal as well.

Cultural Resource Management Goals and Objectives

The goal of cultural resource management is to maintain historic and aesthetic integrity of the sites, preserve socio-cultural values, preserve scientific information, protect heritage values, and include the public in the use of cultural sites. Five objectives have been identified to guide efforts to attain this goal.

Objective 1: Allocate sites within the ACEC to one of four utilization categories: scientific, socio-cultural, public, or discharged uses.

Objective 2: Monitor all known sites to assess and document the nature and rate of deterioration and to provide baseline data on condition.

Objective 3: Inventory and collect data on cultural resources within the ACEC in order to create a systematic data base, to identify presently unknown sites, and to provide information for future management actions.

Objective 4: Coordinate and consult with the Native Americans, the general public and other organizations and individuals concerning the use, allocation, protection, and condition of sites in the ACEC.

Objective 5: Implement a range of physical and administrative, direct and indirect, site protection measures cultural resource values within the ACEC.

Planned Actions

The ACEC contains cultural resources relating to at least 10,000 years of human occupation in the Warner Valley. The prehistoric sites associated with the wetland and aquatic environments that existed in the valley provide an opportunity, perhaps unparalleled in the Great Basin, to study the movements, settlement patterns, and life-styles of these early peoples. In doing so, the complex environmental factors (water cycles, plant and animal succession over long periods, geologic activities, etc.) that sculpted the current form and diversity of the valley will also be unraveled. Current work in the area by the Bureau and cooperating universities has only begun to scratch the surface, both literally and figuratively, of the sites and what they can tell us about the past.

Unfortunately, other forces are at work in the valley altering these sites and our ability to learn from them. Illegal collection of surface artifacts and the excavation of subsurface sites in search of artifacts, as a form of personal recreation or for commercial purposes, has severely damaged many sites. Erosion, both natural and accelerated by surface disturbance, is also exposing and scattering site material; destroying the information contained in the sites before it can be recorded. The inexorable passage of time is also at work, weathering rock-art into oblivion, decaying buried vegetal or animal material and charcoal, and fading into passing the personal and family memories of early Native American and Euroamerican uses and settlement.

The program of management actions described below is designed to provide for appropriate uses which help capture the benefits of cultural resources as well as to preserve and protect them for the future.

Site Allocation for Utilization

Scientific Use: All known sites in the ACEC will be assigned to this category unless action is taken to assign them to another use. The primary use of these sites will be to make them available for scientific and historical investigations. Use by archeological field schools and researchers will be encouraged, including site testing and excavations. A Cultural Resources Use Permit will be required for scientific uses.

Socio-cultural Use: This category includes sites of social and religious importance to the Surprise Valley Band of the Northern Paiute Indians. At this time, only the Anderson Lake burial is assigned to this category.

Public Use: These are sites identified for their value for educational, recreational, and interpretive use. These sites may also receive scientific use. At this time, sites at Flagstaff Lake, Mugwump Lake, Campbell Lake, and Turpin Lake have been assigned to this use. To provide for public use:

- Interpretive signs will be placed at or near site locations;
- Presentations to local schools, civic groups, historical societies, professional societies, and other interest groups will be given;
- Public display cases will be maintained at the BLM District Office, and at other locations as suitable; and
- News releases, newsletter articles, general publications, professional publications, and other means will be used to disseminate information.

The signing and public information program would include entry portal signs, interpretive and explanatory signs, and information signs at recreation sites outlining the legal constraints on artifact collecting. A series of brochures on the cultural resources of the area will also be prepared to better educate the visiting public.

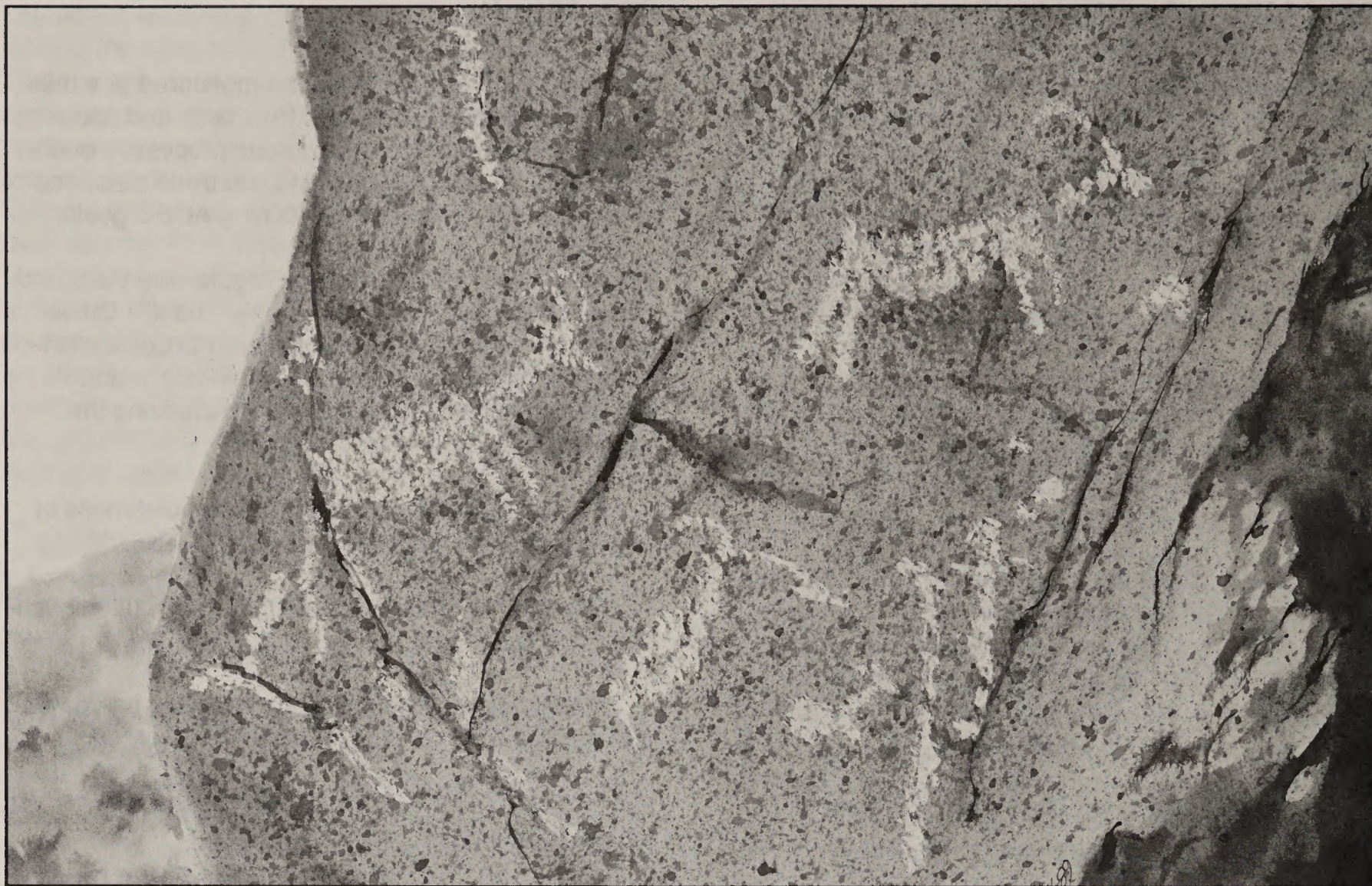
Discharged Use: This category is for sites which no significant value due to loss of site integrity, absence of adequate diagnostic features, or other factors. No known sites have been placed in this category at this time.

Site Monitoring

All known cultural sites would be monitored at a minimum of once every five years to assess and document the nature and rate of various processes of deterioration, to establish baseline site trend data, and to evaluate effectiveness in attaining ACEC goals.

Monitoring will be done through regular site visits and patrols by Bureau and Lake County Sheriff's Office personnel. A site specific action plan to guide monitoring efforts will be completed within two years. Monitoring efforts will focus on characterizing the following items:

- Loss of features that affect the completeness or and accuracy of information conveyed by a site,
- Modification of the vertical and horizontal relationship among site features,
- Modification of the physical, chemical, functional, and aesthetic characteristic of site features, and
- Intrusion to, or occupation of, a site by uses which modify its character.



Site Inventory

A Class III inventory, at the rate of 5,000 acres completed per year, will be done for the ACEC. A Class III inventory is an intensive field survey by a crew of trained observers aimed at locating all the sites that have surface indications. Such an inventory will systematically collect data on cultural resources present. To test the further characterize the sites present, subsurface testing will be completed on ten sites per year. Cost share agreements for site testing and eventual detailed investigation and excavation are expected to include universities and matching grant programs with such organizations as the National Science Foundation and the National Geographic Society.

Professional studies to be completed include an ethnographic study of the historic occupants of the Warner Valley, a detailed historic period study with a complete historic sites inventory, and an oral history of the occupants of the Warner Valley.

Ethnographic Study

The Warner Valley was part of the territory of the Surprise Valley Band of the Northern Paiutes. Some of these people still use the area for hunting, plant gathering, visiting of ancient burial sites and other religious purposes. Under provisions of the Native American Religious Freedom Act, the Bureau has a responsibility to consider the impacts of projects on these uses. Because there is only scanty published information on the Surprise Valley Paiutes, determining the use areas and the impacts that project work may have on them is nearly impossible. Assuming that the Paiutes would participate, completion of this ethnographic study would provide the information needed to fully analyze project proposals.

Historic Period Literature Search

No single source exists documenting the recorded history of events in the Warner Valley, nor has there been an exhaustive search of published and unpublished sources for mention of Warner Valley events. Peter Skene Ogden's 1827 trapping expedition and John C. Fremont's 1843 expedition through the valley are known, but many other early visitor accounts may also exist. Several cavalry posts and forts were built in or near Warner Valley, and a search of old military records could provide much information on the place names, old structures and other historic sites. The Central Oregon Military Wagon Road traverses the valley, again a possible source of information and documents. A complete historical background is needed to place sites and locales in the Warner Valley in perspective to the events that shaped this part of the country. There are many places to look and much information to be collated, but the results of this project will have significant scientific, interpretive, and public relations value.

Oral History Project

This project would be similar in scope and nature to the literature search described above, but would concentrate on recording the oral histories of the valley. Many descendants of the original settlers still live in the valley. Some are quite elderly and their remembrances have not been recorded. The material collected under this project, as for that of the literature search, would be invaluable for the evaluation and management of historic sites within the ACEC, and would lend itself well to interpretive and public outreach aspects of the Bureau's management in the Warner Valley.

Consultation and Coordination

Consultation and coordination would be directed at involving the public in cultural resources management and identifying public attitudes concerning the effectiveness of management actions. The following actions are planned:

Paiute Tribe

Inform the Paiute Tribe at least twice a year about planned and ongoing management activities. Develop a Memorandum of Understanding to cover cultural resource management agreements, particularly concerning socio-cultural sites. Consultations will include development of a Native American burial policy, effects on Native American religious practices, and guidelines for interpreting Paiute Tribal heritage.

Museums

Develop and maintain a museum curation agreement with the University of Oregon and the University of Nevada, Reno. Other museum locations meeting regulatory requirements could also be associated with this effort.

Professional Peer Review Committee

Solicit review and comment on research proposals from professional archeologists and historians.

Recreation Users

Contact recreation users to discuss cultural resource concerns. Provide information on programs and projects that protect cultural resources, as well as problems being encountered. Ask users to avoid sensitive localities and to provide their input concerning interpretation being provided.

Annual Report

Summarize each year's accomplishments in an annual report and submit the report to groups involved in the consultation effort. At minimum the reports will address site condition trends.

Three Year Review

Assess progress toward the overall goal and objectives for the Cultural Resources Management Plan in a written report prepared every three years. Evaluate the need to update or revise the management objectives or actions for the ACEC.

Site Protection

Site protection will cover a broad range of actions designed to physically protect site values or, through administrative actions, to reduce or eliminate factors which are adversely affecting site condition. Direct protection measures may include such measures as removal or modification of surface components of a site to protect the subsurface or rip-rapping a shoreline. Indirect measures may include a program of written and oral communication to change use patterns.

Physical protection measures will be considered when:

- A site has been, or is being, disturbed;
- A site is the remaining site representing a site type;
- A site represents a specific era or activity;
- A site contains a variety of features that represent a specific activity, or an assortment of activities, or
- A site is suitable for interpretation based on its location and the type of information which could be conveyed.

The major natural source of site deterioration is through erosion by wind and water. The present major man-caused source of deterioration is artifact theft, followed by the current major land uses, livestock grazing and recreation. The following actions will be implemented to protect and preserve cultural resources subject to deterioration.

- Manage camping by recreation users to avoid sites and sensitive localities. Encourage minimum impact camping techniques.
- Monitor vehicle use and implement trail closures in locations where significant site damage is occurring.
- Require archeological review and field clearances (as needed) to ensure that any salt block, mineral block, or supplemental feeding of livestock does not occur near a potentially significant site.
- Review permits and leases proposed to be issued or renewed to ensure cultural resource protection measures are incorporated.

- Maintain daily patrols of the area as funds and personnel become available using a combination of Bureau employees and County and State law enforcement officers.

- Consider salvage or physical protection measures for significant sites showing signs of severe weathering, decay, or erosion.

- Subject all land disturbing activities to field review and evaluation under applicable cultural resources laws, regulations, policies, and procedures. Avoid potentially significant impacts by changing the proposed design or location of the project, or by testing or salvaging the site. Project abandonment will also be addressed as an alternative.

Site Specific Management Actions

Site specific actions have been identified for five site localities.

Anderson Lake Burial: Complete a detailed recording of the site, collect surface artifacts, and prepare a topographic site map.

Shellfish Midden Site: Continue detailed subsurface study of this site to provide information on Archaic Period shellfish use in the Great Basin, which is currently poorly documented or understood.

Lake Head Dune Sites: Conduct data recovery on exposed cultural resources which may be lost to erosion. Provide public information at key access points to increase awareness and discourage artifact collecting.

Narrows Westside Site: This site has provided information valuable to understanding and interpreting cultural occupation of the Warner Valley. It has been used by archeological field schools. Unfortunately, artifact theft in the form of surface collecting and digging has occurred. Efforts to record and collect surface artifacts and evaluate the subsurface using archeological field schools will be increased.

Lower Campbell Rock Art Site: Complete a detailed recording of rock art and any associated cultural materials. Test subsurface components of sites and document changes in site conditions.

Program Development and Coordination

The development and coordination of the cultural resources program outlined above for the ACEC will be a full time job during the ten years envisioned for completion. Unless the cultural resources program for the entire District is put on hold for that ten year period, another archeologist position will have to be created and assigned to the Warner Wetlands project.

Projects and Cost Estimates

The following cost estimates assume a ten year completion period for the cultural resources project in the Warner Wetlands ACEC:

Annual Costs

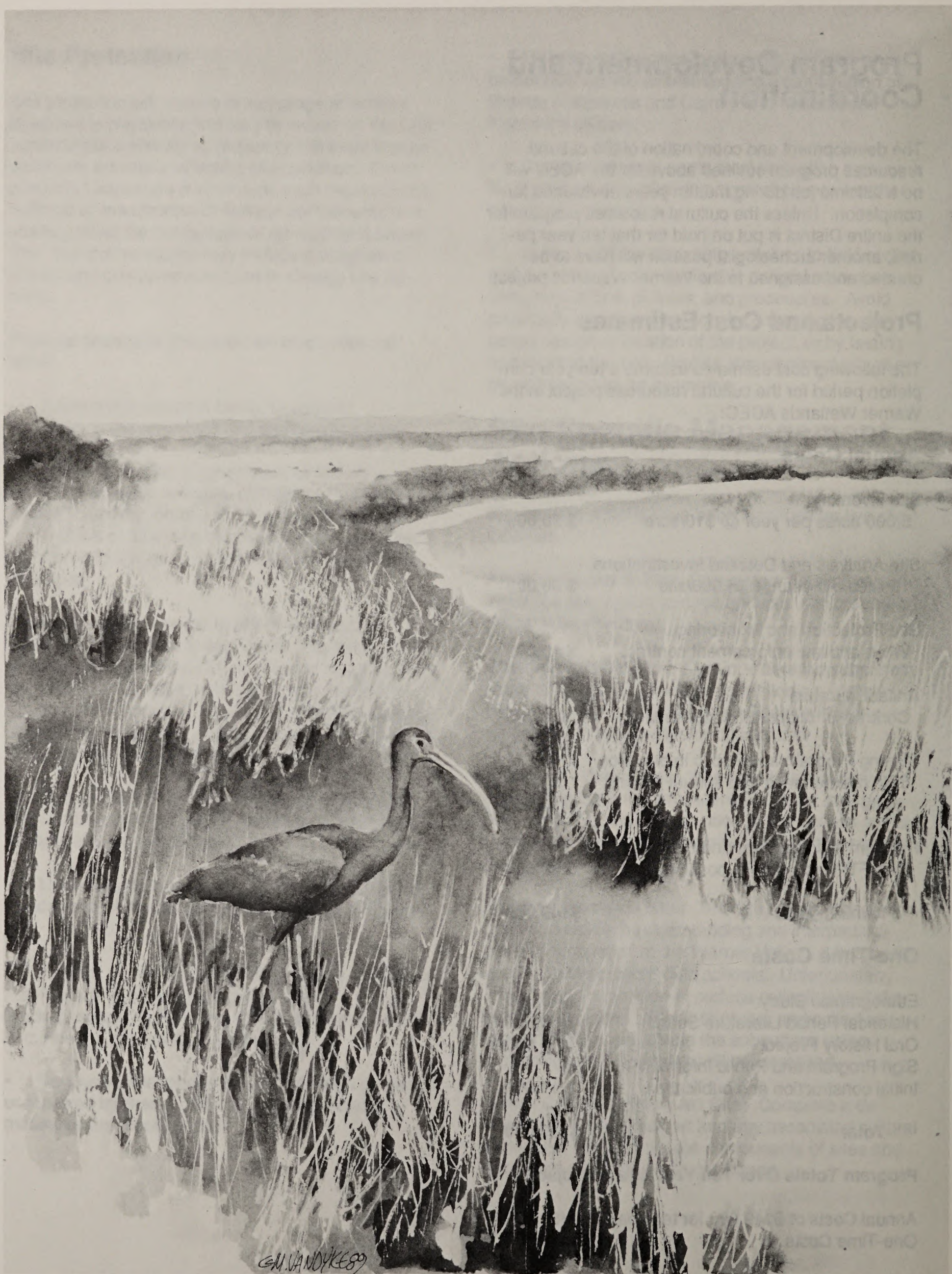
Site inventory	
5,000 acres per year @ \$10/acre	\$ 50,000
Site Analysis and Detailed Investigations	
10 sites per year @ \$5,000/site	\$ 50,000
Site Protection and Monitoring	
WM's and law enforcement contract	\$ 15,000
Artifact Curation	
Contract or cooperative agreement	\$ 1,000
Signing Program and Public Information	
Sign maintenance and annual printing costs	\$ 3,000
Program Development and Coordination	
One FTP archeologist position	\$ 30,000
Annual Total	\$149,000

One-Time Costs

Ethnographic Study	\$ 45,000
Historical Period Literature Search	\$ 50,000
Oral History Project	\$ 24,000
Sign Program and Public Information	
Initial construction and publication	\$ 11,000
Total	\$130,000

Program Totals Over Ten Year Life of Project

Annual Costs of \$149,000 for ten years	\$1,490,000
One-Time Costs	\$ 130,000
Grand Total	\$1,620,000



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Warner Wetlands Geology Management Plan

Introduction

About two hundred million years ago, when dinosaurs stalked the earth, the present location of Warner Valley was located on a portion of the coastal plain along the western shore of the North American continent.

This was a time of slow, but cataclysmic change. The North American continent was slowly separating from Africa and Europe, and simultaneously colliding with the crustal plate forming the floor of the Pacific Ocean.

When continents and ocean floors collide, the less dense rock of the continent overrides the dense ocean floor material, forcing it to sink into the planet's interior. Over tens and scores of millions of years this drifting apart of the continents and sinking of the ocean floor plate continued. As the ocean floor rock descends into the earth, it is heated under unimaginable pressures into liquid rock. This liquid is then carried back towards the surface by convection, often forming a chain of active volcanoes. About 25 million years ago, one such chain formed a line of massive volcanic barrier islands just off the west shore of the continent.

These islands, which now form some of the base rock in the western Cascade Mountains, isolated a portion of the Pacific Ocean and created an inland sea that covered much of south central Oregon, including Warner Valley. For nearly 10 million years these volcanoes spewed searing clouds of steam, ash, and shreds of molten rock for hundreds of miles. Enormous clouds of light-colored airfall ash blanketed the inland sea, settling to the bottom in thick layers.

Then, abruptly in a geological sense, the volcanic activity of the offshore islands stopped and an entirely new kind of eruption began in eastern Oregon. From huge rents or tears in the earth's crust flowed incredible amounts of basalt. Single flows covered thousands of square miles and contained hundreds of cubic miles of molten rock. On and off, for 7 million years, these floods of basalt poured from the earth, filling the inland sea and lapping high on the sides of the old barrier island volcanoes. In all of eastern Oregon, only the tops of isolated mountains remained above the flood of basalt. Then, the volcanic activity once again shifted westward to the Cascades.

While all of this was occurring in what is now eastern Oregon, major geologic events were also occurring to the south and east. Crustal shifting and movement forces, not yet fully understood, were creating a large zone of fault block mountains and valleys. This area, now known as the Basin and Range physiographic province, includes almost all of Nevada and portions of California, Utah, Arizona, New Mexico, Idaho and Oregon. It is characterized by northeast-southwest trending normal faults that form huge blocks of crust that were displaced upwards (horsts) in relation to the adjacent blocks that were displaced downwards (grabens).

Warner Valley is situated atop one such graben block, nestled between the up-thrown horst blocks of Hart Mountain and Fish Creek Rim. Layer on layer of the old flood basalt flows are exposed on the raw cliffs of these blocks, interbedded with layers of ash and other volcanic debris. These same sequences of flows and debris are covered by thick sedimentary deposits in Warner Valley.

The major geological formation of Warner Valley was completed three or so million years ago, although some movement of the fault blocks is likely still in progress. From then until the present, the climate and weather associated factors (flooding, droughts, water and wind erosion, etc.) have been at work sculpting the valley into what we see today. Concentric lines of beach gravels and wave terraces ring the valley, marking the extent of a huge, ice-age lake that filled the basin. Impoverished descendents of this lake remain today as a complex chain of lakes approximately forty miles long; separated, on the northern end, by a unique series of arcuate or bow-shaped dunes. Wind and water are still at work, further refining the form and shape of Warner Valley.

The sketchmap labeled Geological Cross-Section Of Warner Valley shows many of the features discussed above and contains an approximate time-line for their occurrence. This map was prepared from information contained in a U.S. Geological Survey publication titled "Reconnaissance Geologic Map Of The Adel Quadrangle, Lake, Harney, And Malheur Counties, Oregon " by George W. Walker and Charles A. Reppening.

Management Goals and Objectives

In September, 1989, the Lakeview District Manager, Bureau of Land Management, issued a Final Decision that, in part, designated approximately 51,000 acres of public land at the north end of Warner Valley an Area of Critical Environmental Concern (ACEC). This designation was based on the quality and significance of the resources present, including wildlife, archeological, ecological, and geological values. This activity plan is one of five being written to implement the ACEC decision, and to begin actively managing the resource values present in this unique corner of Oregon.

Except for activities authorized under provisions of the 1872 Mining Law (location and mining of claims), the extractive or consumptive aspects of the Bureau's mineral program, as it affects the Warner Wetlands, are clearly identified in the Warner Lakes Plan Amendment for Wetlands and Associated Uplands, and summarized as follows:

Core Wetland Area (Potholes and Acquired)

No surface occupancy of mineral leases within wetland areas.

No disposal of salable materials (sand, gravel, rock, etc.) within wetland areas.

Material sales and leases may be authorized in adjacent uplands, except that any project, development, grant, or lease having a cumulative negative impact on the wildlife habitats of the wetland and upland areas is prohibited.

Meadow Management Area

No surface occupancy of mineral leases within wetland areas.

No disposal of salable materials (sand, gravel, rock, etc.) within wetland areas.

Material sales and mineral leases may be authorized in adjacent uplands.

Grazed Areas (Potholes and Flagstaff Bench)

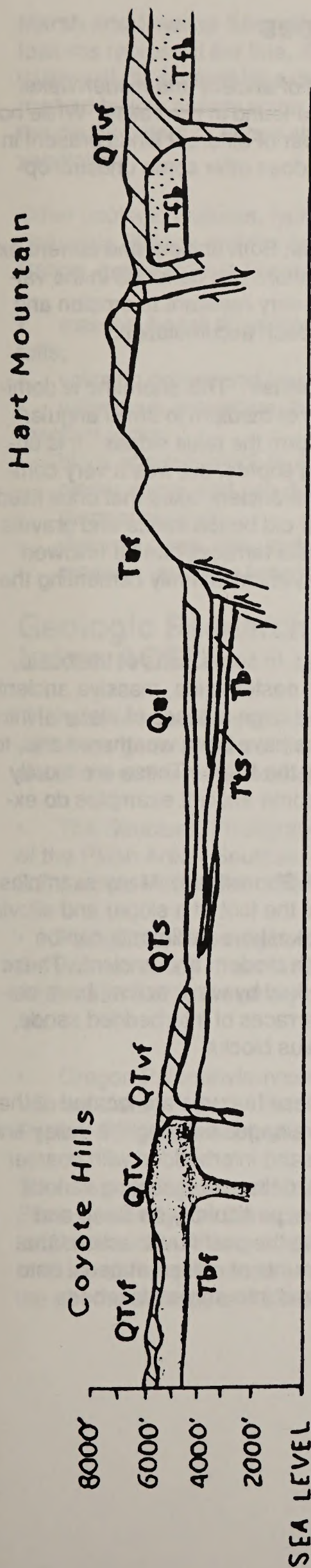
Material sales and mineral leases may be authorized.

This plan is, therefore, directed at developing a management regimen for the non-consumptive aspects of the geological resource, i.e. scientific, recreational, viewing, general interest, etc.

Goal: To enhance the general understanding and awareness, by the local communities, the visiting publics, and the scientific and academic communities, of the geological processes that have shaped the Warner Valley into what it is today.

Objective #1: Develop an interpretive program on site and in the local communities to explain the geological processes that formed Warner Valley and to highlight the unique geological features present.

Objective #2: Encourage the use of the geological resources present, and research into the geological processes that formed the features present, by the geological scientific and academic community.



GEOLOGICAL CROSS-SECTION OF WARNER VALLEY
from U.S.G.S. Map I-446 (1965)

TERTIARY PERIOD		QUATERNARY PERIOD	
Miocene Era	Pliocene Period	Pleistocene Era	Recent Era
25 million years ago	13 million years ago	1 million years ago	10 thousand years ago

- Tfb - basalt and andesite flows and flow breccias.
- Tbf - massive basalt flows and minor interbedded tuffs and scorias.
- Taf - mostly platy andesite flows but contains some flows of porphyritic olivine basalt, basaltic and andesitic flow breccias, and minor amounts of interbedded tuffaceous sedimentary rocks and tuff.
- Tts - mostly fine-grained tuffaceous sedimentary rocks and tuffs representing flood plain or shallow lake deposits
- Tb - basalt flows.
- Qal - unconsolidated fluviatile gravel, sand, and silt.
- Qts - lacustrine, fluviatile and aeolian sedimentary rocks, interbedded with tuff, ashy diatomite, and unconsolidated sand, silt, clay, and gravel.
- (?) - - - - Qtv - agglomerates, breccias, scorias, cinders, ashes, - - - (?) flows, and intrusive masses forming constructional volcanic features, highly modified by erosion.
- (?) - - - - Qtvf - mostly large complex exogenous domes and related - - - (?) flows and flow breccias of rhyodacite composition.

Planned Actions

As the goals and objectives for this plan deal with increasing the understanding of the geological features present in Warner Valley and with the geological processes that created them, a brief summary and description of those features seems appropriate before outlining the specific management actions proposed. Those specific to the ACEC are considered first, followed by those features that are more generalized in the valley.

Arcuate Dunes and Chain Lakes

A unique juxtaposition of topography and climate has created a chain of lakes in the northern third of Warner Valley unlike any other in North America. The valley is broadly open at its southern end, becoming more and more confined by Hart Mountain and Fish Creek Rim until, at the Narrows between Hart and Crump Lakes, there is formed a narrow, mile and a half wide passage between the cliffs. This passage collects and intensifies the prevailing southerly winds. Once through this passage, the winds are still tightly contained on the west by Fish Creek Rim, but the faulting pattern on Hart Mountain has opened the valley abruptly to the northeast. This has created a wind eddy pattern that is especially pronounced on the lee sides of the large sub-faulted blocks and landslide masses along the west face of Hart Mountain.

Climate enters into the picture, in that during wet cycle years the prevailing winds and eddies generate currents in the lake water that distributes sediments into arcuate bars at the north ends of lakes. During dry cycle years the prevailing winds erode sand-sized clay and silt aggregates from the dry portions of the lakebeds and deposits them in large lake-head clay dunes, with the same arcuate shape as the bars formed by the water. As stated by D.L. Weide in his PhD dissertation on Warner Valley, "The chain of seven lakes occupying the north Warner Valley are among the most unique lacustrine features in the Great Basin. Only in this valley do we find a departure from the more common patterns of either single lakes such as Pyramid, Walker, and Abert, or extensive playas such as occupy the Black Rock Desert and Panamint or Spring Valley".

Shore Zone Types

Several different types of ancient and modern lake/shore interfaces can be found in the valley. While not at all unique, the number of different kinds present in a relatively small area does offer some unusual opportunities for study.

Basalt Cliff Shorelines: Both ancient and current examples of this type of shore can be found in the valley. These shores are very resistant to erosion and show little terrace or beach accumulation.

Talus Armored Shorelines: This shoreline is dominated by large masses of medium to small angular basalt fragments that form the talus slopes. It is uncommon along existing shores, but was a very common shoreline along the ancient lakes that once filled the valley. The lines of old beach sands and gravels that form the ancient lake terraces can be followed through the talus fields, at times firmly cementing the talus blocks together.

Landslide Shorelines: In some parts of the basin, most noticeably on the eastern side, massive ancient landslides have pushed large masses of material into the lakes. These slides have been weathered and, to an extent, reworked by the lakes. These are mostly modern features, but some ancient examples do exist.

Colluvial and Alluvial Shorelines: Many examples of colluvial (deposits at the foot of a slope) and alluvial (deposited by water) lakeshore sediments can be found in the valley, both modern and ancient. These processes, often reworked by wave action, have created complex beach terraces of interbedded sands, gravels, rubble, and talus blocks.

Delta Shorelines: These features are located at the mouths of the major drainages entering the valley and are composed of fine sand interbedded with coarser sediments. Sequential deltas representing various lake levels can be seen, particularly on Deep and Honey Creeks, showing the past fluvial actions that have spread large amounts of upland material onto the floor of the valley and into ancient lakebeds.

Marsh and Swamp Shorelines: These shoreline features represent the late, stable conditions of the valley with its present lake development. They are marked by low energy water flow areas which allow the development of dense shoreline and emergent vegetation.

Other geologic features, typical to both the volcanic Columbia Plateau and the fault block Basin and Range, are present in Warner Valley. These include:

- massive basalt flows interbedded with ash and tuffs;
- volcanic domes and intrusive masses;
- tuffaceous, lacustrine, fluvial and aeolian sedimentary rocks;
- block and sub-block faulting;
- cinder cones and ash deposits;
- thermal springs;
- volcanic dikes, sills, and necks; and
- massive landslide topographies.

Geologic Research in the Warner Lakes ACEC

There have been several past research projects within the general area of the ACEC. The following are some of the more extensive:

- The Structure, Stratigraphy, and Paleomagnetism of the Plush Area - Southeastern Lake Co., OR. E.E.Larson, PhD thesis 1965, University of Colorado.
- Postglacial Geomorphology and Environments of the Warner Valley - Hart Mtn. Area, OR. D.L.Weide, PhD thesis 1975, University of California at Los Angeles.
- Oregon Paleoenvironments Research Group, Warner Valley Project - Summer 1984 Preliminary Report. S.Harrison-Metcalf, Oxford, United Kingdom.

There is ongoing research by Gil Graven of Humboldt State University, on the tectonics and structure of the southern end of Warner Valley. The Desert Research Institute of Reno, Nevada has also begun research on the geomorphology and climatic record of the valley.

Implementing Actions

- Design and construct five large interpretive signs to explain the formation of Warner Valley and the major geological features present.

Two identical signs interpreting the valley's formation, to be located on public land where State Highway 120 and the Plush cut-off county road enter the valley.

One sign each interpreting the formation of the arcuate dune and lake system, the different shoreline features, and the exposed basalt flows, located in as yet undetermined spots.

Costs 5 signs @ \$2,500 ea. = **\$12,500**

- Design and install smaller versions of the above signs at each of the recreation sites being developed under the Recreation Activity Plan. These would be a part of the interpretive kiosks planned for these sites. Costs 10 signs @ \$500 ea. = **\$ 5,000**

- Develop and have painted an interpretive brochure explaining the various geological aspects of Warner Valley and containing a self-guiding vehicular tour route demonstrating these aspects. Costs 1 work-month + \$ 3,000 printing = **\$ 5,000**

- Develop and make at least two presentations annually concerning the ACEC's geological resources to local schools, civic groups and other interested parties. Also prepare a narrated slide-tape or video tape show of these geological resources and make it available to groups and organizations outside of the local area. Costs 2 work-months + photographic and reproduction costs = **\$ 8,000**

- Encourage the scientific use of the geological resources by co-sponsoring a field school with an interested university or college. Costs 4 work-months + portion of school cost = **\$20,000**

Total Cost Estimate

Large Interpretive Signs	\$12,500
Small Interpretive Signs	\$ 5,000
Interpretive Brochures	\$ 5,000
Slide/Video Program	\$ 8,000
Field School	<u>\$20,000</u>
Total	\$50,500



Warner Wetlands Habitat Management Plan for Vegetation

Introduction

The Warner Wetlands are located in south-central Oregon on the Lakeview District of the Bureau of Land Management (Map 1). The Warner Wetlands comprise a highly complex and dynamic mosaic of plant communities that fluctuates in response to seasonal and yearly variations in water levels. The northern two-thirds of the area is a maze of lakes, channels, potholes, sloughs and marshes. The southern third contains broad expanses of emergent and seasonally flooded wetlands dominated by tules, cattails, and burreed, interspersed with sedge, rush, and grass meadows. Upland plant communities occur on higher ground among the wetland areas and along the sides of the valley where the land rises in elevation. Upland areas are dominated by greasewood and big sagebrush communities.

Beginning in 1986, the Lakeview Resource Area initiated an amendment to the existing land-use plan (Warner Lakes Management Framework Plan) in order to place increased emphasis on the management, protection, and enhancement of these wetlands. This planning change resulted in the Warner Lakes Plan Amendment for Wetlands and Associated Uplands, which was issued with a Proposed Decision in May, 1989. A Final Decision was issued in September, 1989, and it is this decision that forms the basic guidance for this Habitat Management Plan (HMP).

The plan amendment established an Area of Critical Environmental Concern (ACEC), shown on Map 2. This HMP covers the same area as the ACEC, and consists of all BLM administered land within the ACEC boundaries. Included is approximately 50,000 acres of vacant and acquired public land and an additional 1,120 acres of U.S. Fish and Wildlife Service lands administered by BLM through a cooperative agreement with the Hart Mountain National Antelope Refuge. Any additional land subsequently acquired or administered by BLM for the ACEC will also be covered by this HMP.

The ACEC is divided into five management areas (Map 3), with management goals for each area identified by the plan amendment. The management goal for the Core Wetland Areas (Potholes and Acquired) is to improve the wildlife resource values, eliminating all conflicting uses, demands, and allocations. The management goal for the Grazed Areas (Potholes and Flagstaff Bench) is to provide for increased livestock forage production, while improving the composition, vigor, and density of the present range site plant communities. The management goal for the Meadow Management Area is to place primary emphasis on improving wildlife habitat condition or enhancement while providing opportunities for other uses.

The overall management goal for the entire ACEC, to which all resource uses must conform, is to emphasize the preservation and protection of unique wildlife, ecological, cultural, and geologic values identified within the ACEC. This HMP for vegetation supports the preservation and protection of unique ecological values by establishing baseline data on the vegetation and monitoring how the vegetation responds to management actions.

Environment

The Warner Wetlands are located within the closed hydrologic basin of Warner Valley, at the northern terminus of the basin. The environment is characterized by broad fluctuations in temperature, precipitation, and water levels. Seasonal temperatures range from 100 degrees Fahrenheit to 20 degrees below zero. Annual precipitation, mostly in the form of winter snow, can vary from 6 to 20 inches.

The principal water flow into the basin occurs during spring run-off in the Warner Mountains to the west, and arrives via the Honey Creek, Deep Creek, and Twentymile Creek drainages. The southern part of the HMP area is watered each year by direct irrigation, irrigation waste water, and/or spring run-off waters. To the north water is usually available only after flood events, and then slowly recedes over a period of years. The plant communities have developed under this flood/drought regime, with an average span of 5 to 10 years between flood events.

Sesuvium verrucosum

A species of special interest within the HMP area is *Sesuvium verrucosum*, verrucose sea-purslane, which has been nominated as a Bureau sensitive species in Oregon. This species is on List 2 of the Oregon Natural Heritage Data Base (May 1989): species threatened in Oregon, but more common or stable elsewhere. The plant is a prostrate, fleshy herb with numerous branches, rose-colored sepals, and no petals. It grows in low-lying saline or alkaline habitats. In Oregon, *Sesuvium verrucosum* is known only from the Warner Valley in Lake County and Tum Tum Lake in Harney County. Outside of Oregon, *Sesuvium verrucosum* occurs south through California to Baja California, east to Utah, Kansas, Texas, and northern Mexico; it also occurs in southern Brazil.

Within the HMP area, *Sesuvium verrucosum* has been found in scattered locations between Flagstaff Lake and Anderson Lake, east of Mugwamp and Swamp Lakes. The known habitat covers approximately 400 acres, all within the Core Wetland Area (Acquired) except for a small area approximately 2 acres in size within the Grazed Area of Flagstaff Bench.

Sesuvium verrucosum also occurs in several other locations in the Warner Valley outside the HMP area.

No state-listed or federally-listed threatened or endangered plants, or plants that are candidates for listing, are known to occur in the HMP area.

Management Goals and Objectives

Goal 1: Establish baseline data on vegetation for future management decisions and scientific use by completing a thorough vegetation inventory of the 51,045 acres of public land within the ACEC.

Objective #1: Inventory the 21,593 acres of public land in the Potholes portion of the Core Wetland Area within 5 years to establish a baseline for ecological succession studies.

Objective #2: Inventory the 20,500 acres within the Potholes and Flagstaff Bench grazed portions of the ACEC within 5 years as a baseline for evaluating changes in density, vigor, and composition of plant communities.

Objective #3: Inventory the 8,952 acres of public land in the Meadow Management Area and the Acquired portion of the Core Wetland Area to establish a baseline for ecological succession studies and evaluating changes related to wildlife management actions.

Goal 2: Determine the effects of different management regimes on the vegetation in the five management areas of the ACEC in order to assess and adjust management strategies, as well as facilitate and promote scientific studies on the vegetation.

Objective #1: Measure and document plant community succession in response to natural fluctuations in water levels and the removal of grazing by establishing at least 4 vegetation monitoring studies in the Potholes portion of the Core Wetland Area.

Objective #2: Assess the effect of different grazing systems on nonforage species to supplement range monitoring studies by establishing at least 4 vegetation monitoring studies in the grazed portions of the ACEC.

Objective #3: Compare changes in density, vigor, and composition over time in grazed and ungrazed portions of the ACEC by establishing at least 4 pairs of vegetation monitoring studies.

Objective #4: Measure and document the vegetation response associated with (1) reintroduction of deep water emergent marsh through irrigation, (2) reestablishment of shallow emergent marsh and marsh edge through irrigation, and (3) mixed use of burning/haying/grazing and irrigation, by establishing at least 3 vegetation monitoring studies in the Meadow Management Area and Acquired portions of the Core Wetland Area.

Goal 3: Ensure that *Sesuvium verrucosum* and special status plants within the ACEC and their habitats are protected.

Objective #1: Manage for healthy, viable populations of *Sesuvium verrucosum* in the ACEC by determining habitat requirements and population trends.

Objective #2: Manage for healthy, viable populations of any special status plants found during inventories of the ACEC.

Goal 4: Encourage scientific and educational uses of the vegetation resources in the ACEC, particularly in relation to plant community succession, habitat requirements of selected species of management interest, and vegetation responses to different management regimes.

Objective #1: Increase awareness and interest in the scientific community of the vegetation resources in the ACEC, emphasizing the potential for scientific and educational use of the area.

Objective #2: Increase awareness and interest in the general public of the vegetation resources in the ACEC through interpretive displays, brochures, handouts, presentations, and other media.

Planned Actions

Inventories

Vegetation in the Warner Valley was quantitatively sampled under a National Science Foundation grant in 1980, but most of the sample sites were south of the ACEC. A floristic inventory resulting in a species list primarily for wetland areas was completed by the BLM in 1987, but did not include those lands later acquired in the southern part of the ACEC or provide quantitative data on the plant communities. Systematic inventories of plant communities in the entire ACEC are needed to establish baseline data for ecological studies and management decisions. The inventory work will provide a complete record for the ACEC and build on information available from the previous studies. Information gained from inventories will also be useful for interpreting the vegetation to visitors.

To conduct the inventories, aerial photos will be used to subdivide the vegetation into homogenous subunits. General patterns from the aerial photos will be outlined prior to field work. Wetland types will be outlined based on National Wetlands Inventory maps for the area compiled by the U. S. Fish and Wildlife Service from aerial photos. The pretyped patterns of wetlands and uplands can then be investigated and adjusted by means of field reconnaissance, in order to establish units defined by dominant species.

Maps constructed from air photo and field reconnaissance will be used as a guide for the selection of sample areas to quantitatively describe the plant associations. Sampling methods will be determined after field reconnaissance, but are likely to be selected from the following methods according to the vegetation type sampled.

Shrub associations

Line transects, each 30 m long, are located in areas of uniform vegetation. A 25 x 50 cm rectangular quadrat is used to determine plant density and frequency. The quadrat is placed at 2 m intervals for a total of 15 plots per transect. Cover for each shrub species is determined using the line intercept method. Shrub density is measured in a 1 x 30 m plot situated parallel to each transect line. Percent cover of vegetation, litter, rock, and bare ground are estimated in the 25 x 50 cm quadrats, using Daubenmire cover classes.

Grass associations

Methods are similar to those described for shrublands. Thirty meter transects are placed in areas of homogenous vegetation, and 25 x 50 cm quadrats are placed parallel to the tape at 2 m intervals. The different species of plants and the Daubenmire cover classes of vegetation, litter, rock, and bare ground are recorded for each quadrat. Because of the density of the vegetation, the number of individual plants are not counted.

Wetland areas

Transects are established perpendicular to the water's edge, beginning on dry land and running into shallow water. Transect length varies in proportion to the area sampled. The line interval method is used to record presence or absence of a species along each 25 cm interval. Other parameters may be measured such as water depth and water alkalinity/salinity.

Relevé Method

This method can be used for any vegetation type, but is more qualitative than the previous methods. However, it can be argued that because plant cover tends to be heterogenous from point to point and from time to time even within a small stand, an exact measurement at any one place gives an aura of precision to community description that is not warranted.

After field reconnaissance, a number of stands that represent a given community are subjectively chosen. As much of each stand is walked as possible to compile a list of all species encountered. A minimal area quadrat, or relevé, is located in a representative area. The minimal area for a given vegetation type is the smallest area within which the species of a community are adequately represented, and will vary in size depending on the vegetation type sampled. For each relevé, species are recorded and parameters are estimated such as cover, sociability, vigor, seasonal importance, topographic characteristics, and environmental characteristics.

Regardless of which methods are chosen to sample the vegetation, data will be organized into association tables to aid in classifying the plant associations present. The Nature Conservancy is currently developing wetland dominance types in Oregon, based on plant communities, to complete the lowest level of the wetland classification hierarchy formulated by the U. S. Fish and Wildlife Service for use in the National Wetlands Inventory. Classification of wetland plant associations will be coordinated with this system. During field reconnaissance and sampling, all plant species encountered will be recorded and unknown species will be collected for identification.

Inventories of the ACEC will result in:

- A vegetation map of the ACEC prepared from aerial photos and ground truthing.
- A classification and description of plant associations based on sampling the vegetation.
- A complete list of plant species occurring in the ACEC.
- Results of the vegetation inventories will be submitted for publication.

Vegetation Monitoring Studies

Vegetation monitoring studies will measure the response of the vegetation to management actions implemented by other activity plans for the five management areas of the ACEC. Methods and study placement will be selected after field reconnaissance. The final monitoring plan will be incorporated into the HMP within four years of implementation. The four types of monitoring studies planned are described below by management area.

Core Wetland Area (Potholes)

This area contains a complex system of channels, sloughs, lakes, potholes, and uplands that has been grazed for over a hundred years. Upon implementation of the wildlife HMP, the core potholes area will be completely fenced off, excluded from grazing, and allowed to return to a natural condition. Other than recreational facilities at Campbell and Turpin Lakes, no major habitat manipulation is planned for this 21,593 acre area.

This creates an unprecedented opportunity to measure and document plant community succession in response to (1) the removal of grazing, and (2) natural year-to-year fluctuations in water levels. Permanent, relocatable transects will be set up in at least four different areas of wetland and upland vegetation such as lake shores, potholes, channels, playas, and clay dunes. Changes in species composition will be monitored on a yearly basis. Variables such as vegetation height and water depth will also be measured. Methods may include the following or others found to be appropriate after field reconnaissance.

Nested Frequency Method: Presence or absence of each species is recorded in nested plots of successively larger sizes, such as 5 x 5 cm, 25 x 25 cm, 25 x 50 cm, and 50 x 50 cm. When a species occurs within one plot, it also occurs in each successively larger plot. This method is objective, repeatable, and rapid. Use of the nested plot configuration improves the chance of selecting a proper size plot for frequency sampling. The method is detailed in BLM Technical Reference 4400-4.

Line Interval Method: Presence or absence of each species is recorded along 25 cm intervals of a line transect. This method is suitable for wetland vegetation and studying vegetation dynamics over a period of time.

Grazed Areas (Potholes and Flagstaff Bench)

The grazed areas are primarily uplands consisting of greasewood and big sage communities, with a small percentage of wetland vegetation. These areas are to be managed to provide for increased livestock forage production, while improving the composition, vigor, and density of the present range site plant communities. Details on grazing management can be found in the Warner Wetlands Allotment Management Plan (AMP). Briefly, Flagstaff Bench and the North Pasture of the Potholes will be grazed each year; the Middle and Well Pastures of the Potholes will each be alternately grazed for two years and rested for two years.

Two types of studies will be established in the grazed areas. One study will assess the effect of different grazing systems on nonforage species, and will supplement range monitoring studies on the forage species. Studies will be established in the North, Middle, and Well Pastures of the Potholes and in the Flagstaff Bench Grazed Area for comparison. The nested frequency method, described previously, will be used to monitor changes in species composition and frequency on a yearly basis.

A second study will compare changes in density, vigor, and composition over time in grazed and ungrazed portions of the ACEC. Four pairs of monitoring studies will be set up in comparable communities occurring in grazed and ungrazed areas, using permanent, relocatable transects. The nested frequency method will be used to monitor changes in species composition. An appropriate plot size will be selected to measure the density of key forage species. Vigor of key species will be assigned to one of the following categories: (1) very feeble and never fruiting, (2) feeble, (3) normal, (4) exceptionally vigorous. Monitoring will be repeated every two years.

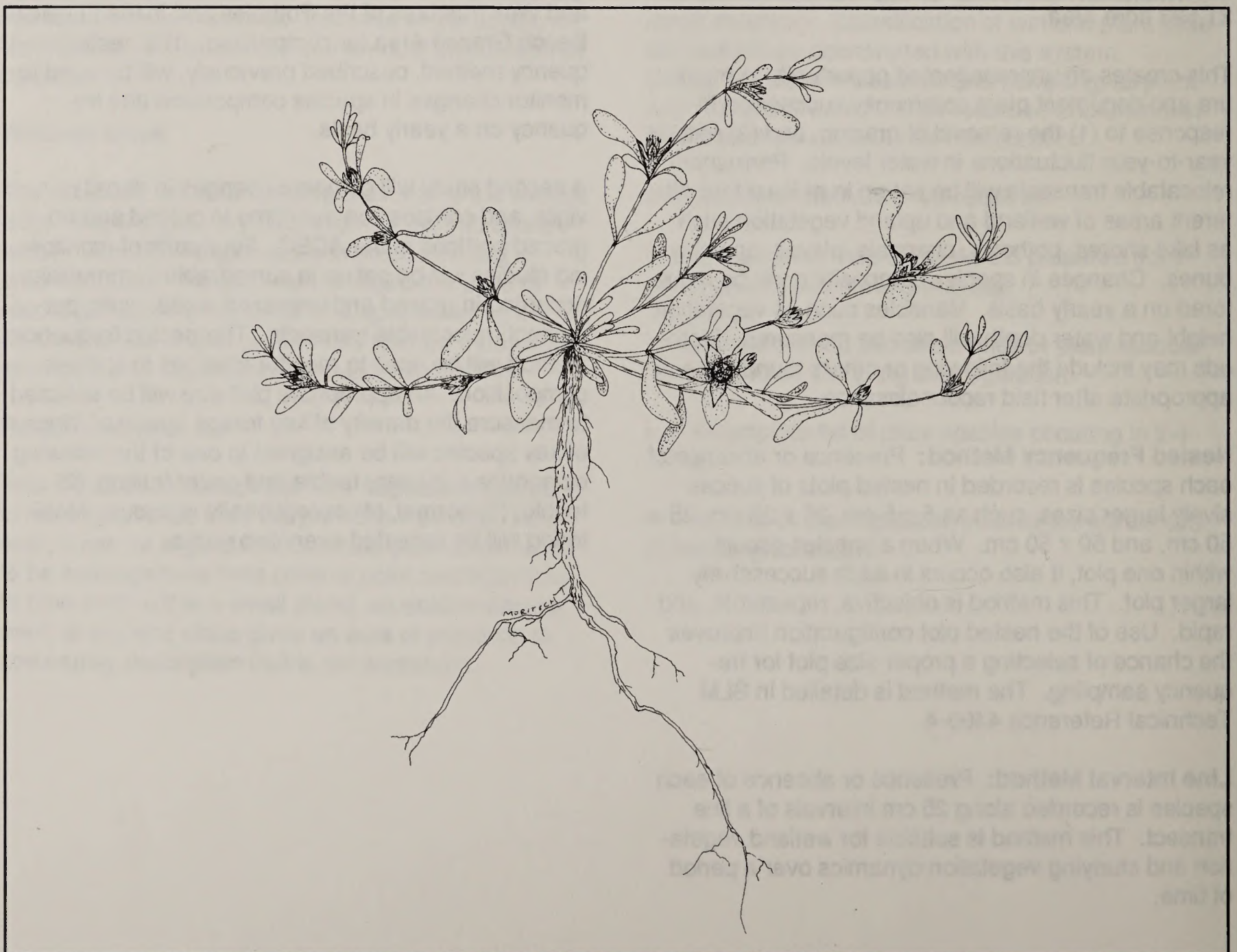
The placement of transects in grazed areas will be coordinated with the range staff. Data on livestock numbers, utilization, and season of use will be obtained from the range program for analysis and interpretation of the vegetation monitoring studies in grazed areas. Results will be shared with the range staff.

Core Wetland Area (Acquired) and Meadow Management Area

The Core Wetland (Acquired) and Meadow Management Areas are an interconnected and interdependent mosaic of natural and man-made wetlands, containing meadows, deep and shallow water emergent communities, channels, sloughs, ponds, and lakes. Much of the area was modified by agricultural practices in the past. The wildlife HMP proposes major project work for both areas to enhance and develop wildlife habitat. Management actions include the use of irrigation to control water levels, pothole blasting and push-up

islands to create additional habitat, and the use of burning and/or haying to control vegetation height. Grazing may also be used to control vegetation height in the Meadow Management Area, but is prohibited in the Core Wetland Area (Acquired).

Vegetation monitoring studies will be established to measure and document the vegetation response to habitat manipulation. Studies will be set up in areas targeted for: (1) reintroduction of deep water emergent marsh through irrigation, (2) reestablishment of shallow emergent marsh and marsh edge through irrigation, and (3) mixed use of burning/haying/grazing and irrigation. Study placement will be coordinated with the wildlife staff. Methods used may include nested frequency, line interval, density, or other methods found to be appropriate after field reconnaissance. Variables such as species composition, vegetation height, and water depth will be monitored. Monitoring will be repeated every two years, and results shared with the wildlife program.



Sesuvium verrucosum (verrucose sea-purslane) by Barbara Moritsch.

***Sesuvium verrucosum* and Special Status Plants**

The Warner Valley is one of only two areas where *Sesuvium verrucosum* is known to occur in Oregon. Although this species is widely distributed outside of Oregon, as part of Oregon's natural heritage it is a species worthy of preservation and consideration in all management actions.

The following actions will be taken to manage for and preserve healthy, viable populations of *Sesuvium verrucosum*.

- Map all populations of *Sesuvium verrucosum* on U.S.G.S. topographic maps and update site report forms.
- Monitor the trend and biology of *Sesuvium verrucosum* populations.

Establish at least one quadrat frequency study to monitor the trend of *Sesuvium verrucosum* on a yearly basis. Also establish at least one permanently marked belt transect to monitor population biology on a yearly basis for a period of five years. Record information on phenology, vigor, and age classes. Also record observations on habitat requirements and impacts of fluctuating water levels on population area and numbers.

Monitor populations at least twice a year to record observations of any impacts from herbivores or humans such as trampling, damage by vehicles, wildflower collecting, etc.

- If monitoring reveals a population decrease of 20% or more, take immediate steps to identify and eliminate the detrimental activity.
- Conduct project clearances for any proposed actions which could potentially affect habitat or existing populations of *Sesuvium verrucosum*.

At the present time, no known special status plants occur in the ACEC. If any such plants are found during vegetation inventories, actions will be taken similar to those outlined for *Sesuvium verrucosum* above, to preserve healthy, viable populations.

Scientific and Educational Uses

The Warner Wetlands ACEC has great potential for various ecological studies to improve our understanding and management of this unique ecosystem.

There is further opportunity to communicate what is learned to others who visit the area. A number of actions will be taken to encourage scientific and educational uses of the vegetation resources in the ACEC, particularly in relation to plant community succession, habitat requirements of selected species (autecological studies), and vegetation responses to different management regimes.

- Distribute the HMP and initial results from vegetation inventories and monitoring studies with requests for proposals and involvement to universities, colleges, and interest groups with scientific expertise.
- Publish and encourage the publication of technical papers and studies related to vegetation resources in the ACEC.
- Assist field schools and scientists conducting field studies related to plant community succession, habitat requirements of selected species, and vegetation responses to management actions.

An interpretive program will be developed to increase awareness and interest in the general public of the vegetation resources in the ACEC, and will include the following actions.

- Prepare and provide interpretation of the vegetation environment at recreation facility sites at Flagstaff, Campbell, and Turpin Lakes through interpretive displays and brochures. Identify plants along nature trails with small signs similar to those used in arbore-tums.
- Develop interpretive displays on vegetation for Hart Lake Bar Recreation site, Flagstaff Bench Overlook, and Hart Mountain Overlook.
- Prepare a general vegetational handout on the Warner Wetlands ACEC to describe types of wetland plants and their adaptations to different wetland environments: emergents, submergents, floating-leaf plants, and floating plants. Also describe plant communities in the ACEC and vegetational patterns resulting from water fluctuations.
- Develop a slide show on the vegetation resources suitable for presentations to local schools, civic groups, and other interested groups.

Evaluation and Monitoring

A report will be prepared to summarize inventory results after the field work is completed (year 6), and will include information on the plant communities present and a species list for the ACEC. The report will be submitted for publication to increase knowledge and understanding of the plant communities in this poorly-known Great Basin ecosystem.

Detailed information on monitoring *Sesuvium verrucosum* and vegetation resources in different management areas is given in the Planned Actions section of this HMP. Monitoring studies will be designed based on field reconnaissance, and incorporated into the HMP within four years of implementation. Results will be shared annually with BLM's range and wildlife programs. If monitoring of *Sesuvium verrucosum*

shows a population decrease of 20% or more, immediate steps will be taken to identify and eliminate the detrimental activities.

Records will be maintained on expressed interest and actual use of the ACEC for ecological studies and education.

Costs and Funding Needs

Costs are estimated below for each project. Costs are based on \$3,000 per work-month (WM), which includes vehicles and equipment. The addition of a FTE Botanist/Ecologist position is needed to supervise and coordinate implementation of the HMP, since the required workload is beyond the Area botany program's current capabilities. A permanent position will provide the expertise and continuity necessary to ensure the successful implementation of the HMP.

Inventories

Annual Costs (for each of 5 years)

Vegetation Map (2 WM)	6,000
Field sampling of 10,000 acres (6 WM + \$3,000 per diem)	21,000
Species identification (3 WM)	9,000
Data analysis (3 WM)	<u>9,000</u>
	\$45,000

One-time Cost

Final Inventory Report with vegetation map and classification of plant associations (6 WM + \$2,000 materials)	20,000
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Total Cost of Inventories

\$45,000/year x 5 years + \$20,000	\$245,000
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Vegetation Monitoring Studies

Annual Cost (for each of 7 years)

Record and analyze data on established monitoring studies (3 WM/study x 3 studies/year = 9 WM)	27,000
Per diem (\$1,000/study x 3 studies/year)	<u>3,000</u>
	\$30,000

One-time Cost

Design and establish monitoring studies (3 WM/study x 4 studies = 12 WM)	36,000
Per diem (\$1,000/study x 4 studies)	<u>4,000</u>
	\$40,000

Total Cost of Vegetation Monitoring Studies

\$30,000/year x 7 years + \$40,000	\$250,000
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Sesuvium verrucosum

Annual Cost (over 8 years)

Record and analyze data on established monitoring studies
(2 WM + \$1,000 per diem)

7,000

One-time Cost

Map populations on topographic maps
(2 WM + \$1,000 per diem)
Design and set up monitoring studies
(2 WM + \$1,000 per diem)

7,000

7,000
\$14,000

Total Cost for *Sesuvium verrucosum*

\$7,000/year x 8 years + \$14,000

\$70,000

Scientific and Educational Uses

Annual Cost (for each of 5 years)

Co-sponsor field school or scientific studies (2 WM + \$10,000 cost-share)

\$16,000

One-time Costs

Plant identification along nature trails at Turpin Lake and south of Flagstaff Lake
(2 WM + \$1,000 materials)
Develop material for interpretive displays (6 displays @ \$4,000 each)
Develop and have printed an interpretive brochure on vegetational resources in
the ACEC (2 WM + \$3,000 printing)
Develop a slide show on vegetational resources in the ACEC
(2 WM + \$2,000 photographic costs)

7,000

24,000

9,000

8,000
\$48,000

Total Cost of Scientific and Educational Uses

\$16,000/year x 5 years + \$48,000

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Grand Total for HMP over 10 years

Inventories
Vegetation Monitoring Studies
Sesuvium verrucosum
Scientific and Educational Uses

245,000

250,000

70,000

128,000

Grand Total

\$693,000

Evaluation and Monitoring

Annual Cost (over 5 years)
 \$10,000 x 5 years = \$50,000
 One-time Cost
 \$10,000
 Total Cost
 \$60,000

Investment

Plant identification along stream bank at Tropicana and south of Tropicana
 \$10,000
 Design material for stream bank design is \$10,000
 \$10,000
 One-time Cost
 \$10,000
 Annual Cost (over 5 years)
 \$10,000 x 5 years = \$50,000
 Total Cost
 \$60,000

Vegetation Monitoring

Annual Cost (over 5 years)
 \$10,000 x 5 years = \$50,000
 One-time Cost
 \$10,000
 Total Cost
 \$60,000

Scientific and Educational Uses

Annual Cost (over 5 years)
 \$10,000 x 5 years = \$50,000
 One-time Cost
 \$10,000
 Total Cost
 \$60,000

One-time Costs

Plant identification along stream bank at Tropicana and south of Tropicana
 \$10,000
 Design material for stream bank design is \$10,000
 \$10,000
 One-time Cost
 \$10,000
 Annual Cost (over 5 years)
 \$10,000 x 5 years = \$50,000
 Total Cost
 \$60,000

Grand Total for HMP over 10 years

Annual Cost (over 5 years)
 \$10,000 x 5 years = \$50,000
 One-time Cost
 \$10,000
 Total Cost
 \$60,000

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